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IN THE

Supreme Court of the United States

OCTOBER TERM, 1986

ETSI PIPELINE PROJECT,
Petitioner,
v.
STATE OF MISSOURI, *et al.*,
Respondents.

DONALD P. HODEL, SECRETARY OF THE INTERIOR, *et al.*,
Petitioners,
v.
STATE OF MISSOURI, *et al.*,
Respondents.

On Writ of Certiorari to the United States Court of Appeals for the Eighth Circuit

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BRIEF OF PETITIONER ETSI PIPELINE PROJECT

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QUESTIONS PRESENTED

1. Whether the Secretary of the Interior is authorized under the Flood Control Act of 1944 to contract for the beneficial use of excess irrigation water stored in the main stem reservoirs of the Missouri River Basin.

2. Whether the Court of Appeals improperly substituted its own view for that of the Secretary of the Interior concerning the appropriate construction of the Flood Control Act of 1944.

LIST OF PARTIES

The following parties were plaintiffs in the District Court and appellees in the Eighth Circuit on the issue of the Secretary of the Interior's authority under the Flood Control Act of 1944: the States of Missouri, Iowa and Nebraska, Kansas City Southern Railway Company, the Sierra Club and the Nebraska, Iowa and Rocky Mountain Chapters of the Farmers Educational and Cooperative Union of America.

The following parties were defendants in the District Court and appellants in the Eighth Circuit * on the issue of the Secretary of the Interior's authority under the Flood Control Act of 1944: Energy Transportation Systems Inc. [now ETSI Pipeline Project, per order of this Court dated March 2, 1987; in this brief, all references will be to ETSI Pipeline Project]; Colonel William R. Andrews, Jr. [Steven G. West], District Engineer, Omaha District, United States Army Corps of Engineers; Brigadier General Mark J. Sisinyak [Charles E. Dominy], Division Engineer, Missouri River Division, United States Army Corps of Engineers, Omaha, Nebraska; Lieutenant General J.K. Bratton [E.R. Kieberg, III], Chief of Engineers, United States Army Corps of Engineers; John O. Marsh, Jr., Secretary of the Army; Joseph B. Marcotte, Jr., Regional Director, Upper Missouri Region, Bureau of Reclamation; Robert N. Broadbent [C. Dale Duvall], Commissioner, Bureau of Reclamation; Maxwell T.L. Lieurance, Wyoming State Director, Bureau of Land Management; Robert F. Burford, Director, Bureau of Land Management; Garrey E. Caruthers [Wayne N. Merchant], Assistant Secretary of the Department of the Interior for Land and Water Resources [Assistant Secretary of the Department of the

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* Where the named parties have changed, the new names are included in brackets. Similarly, where the title of a position has changed, the new title is in brackets.

Interior for Water and Science]; James G. Watt [Donald P. Hodel], Secretary of the United States Department of the Interior; Craig W. Rupp, Regional Forester, Region II, (Rocky Mountain Region), United States Forest Service; R. Max Peterson, Chief, United States Forest Service; John R. Block [Richard E. Lyng], Secretary of the United States Department of Agriculture; Anne M. Gorsuch [Lee M. Thomas], Administrator, Environmental Protection Agency.

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BRIEF OF PETITIONER ETSI PIPELINE PROJECT

OPINIONS BELOW

The majority and dissenting opinions of the Court of Appeals are reported at 787 F.2d 270 and appear as Appendix A to the Petition for a Writ of Certiorari ("Pet. App. A").[1] The opinion of the United States Dis-

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[1] The following abbreviations are used in this brief: "Pet. App." refers to the Appendix to ETSI Pipeline Project's Petition for a Writ of Certiorari; "J.A." refers to the Joint Appendix filed in conjunction with the briefs on the merits; "App." refers to the Appendix to this brief; and "A.R." refers to the Administrative Record filed with the district court.

trict Court for the District of Nebraska is reported at 586 F. Supp. 1268 and appears as Pet. App. B.

JURISDICTION

The jurisdiction of this Court is invoked under 28 U.S.C. § 1254(1). The judgment of the United States Court of Appeals for the Eighth Circuit was entered on March 13, 1986. Pet. App. C. The petition for rehearing and suggestion of rehearing en banc were denied by order dated July 10, 1986. Pet. App. D. The petition of ETSI Pipeline Project ("ETSI")[2] for a writ of certiorari was filed on December 8, 1986 in accordance with an extension of time for filing granted by Justice Blackmun. The petition was granted on March 2, 1987.[3]

STATUTES INVOLVED

Section 9 of the Flood Control Act of 1944,[4] Pub. L. No. 78-534, ch. 665, 58 Stat. 887, provides in part:

> (a) The general comprehensive plans set forth in House Document 475 and Senate Document 191, Seventy-eighth Congress, second session, as revised and coordinated by Senate Document 247, Seventy-eighth Congress, second session, are hereby approved and the initial stages recommended are hereby authorized and shall be prosecuted by the War Department and the Department of the Interior as speedily as may be consistent with budgetary requirements.

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[2] The petition was filed in the name of Energy Transportation Systems Inc. By letter dated January 27, 1987, ETSI Pipeline Project, the real party in interest in this litigation, requested that it be substituted for the corporation. That request was granted on March 2, 1987.

[3] In its March 2, 1987 order, the Court likewise granted the petition for a writ of certiorari filed by Secretary of the Interior Donald P. Hodel and the other federal parties, and it consolidated the cases.

[4] All other pertinent provisions of the Flood Control Act of 1944 are reprinted in Pet. App. E.

(b) The general comprehensive plan for flood control and other purposes in the Missouri River Basin approved by the Act of June 28, 1938, as modified by subsequent Acts, is hereby expanded to include the works referred to in paragraph (a) to be undertaken by the War Department; and said expanded plan shall be prosecuted under the direction of the Secretary of War and supervision of the Chief of Engineers.

(c) Subject to the basin-wide findings and recommendations regarding the benefits, the allocations of costs and repayments by water users, made in said House and Senate documents, the reclamation and power developments to be undertaken by the Secretary of the Interior under said plans shall be governed by the Federal Reclamation laws (Act of June 17, 1902, 32 Stat. 388 [43 U.S.C. §§ 372 et seq.] and Acts amendatory thereof or supplementary thereto) . . . .

Section 9(c) of the Reclamation Project Act of 1939, 43 U.S.C. § 485h(c) (1982), provides in part:

> The Secretary is authorized to enter into contracts to furnish water for municipal water supply or miscellaneous purposes: Provided, That . . . [n]o contract relating to municipal water supply or miscellaneous purposes . . . shall be made unless, in the judgment of the Secretary, it will not impair the efficiency of the project for irrigation purposes.

Section 212(b) of the Reclamation Reform Act of 1982, 43 U.S.C. § 390*ll*(b) (1982), provides:

> Notwithstanding any other provisions of this section to the contrary, obligations that require water users, pursuant to contracts with the Secretary, to repay the share of construction costs and to pay the share of the operation and maintenance and contract administrative costs of a Corps of Engineers project which are allocated to conservation storage or irrigation storage shall remain in effect.

STATEMENT OF THE CASE

A. ETSI's Contract

In 1981, ETSI obtained a water use permit from the State of South Dakota [5] allowing it to appropriate specific amounts of water from Lake Oahe, a federal reservoir located entirely within that state.[6] J.A. 152. ETSI planned to transport the water by aqueduct to the Powder River Basin in Wyoming to be mixed with coal and then to move the slurry mixture through an approximately 1,000-mile long coal slurry pipeline to coal-fired power plants in the southeastern United States. South Dakota conditioned its permit on ETSI's agreement to make certain periodic payments to the State and to deliver water to several South Dakota communities along the aqueduct that lack adequate water supplies of their own. *Id.*

With its state permit in hand, ETSI applied to the Secretary of the Interior ("the Secretary") for a water service contract permitting it to withdraw 20,000 acre feet of water per year from Lake Oahe. After consultation with the United States Army Corps of Engineers

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[5] As part of its industrial water marketing program, the Bureau of Reclamation requires an applicant for a federal water service contract to first obtain any necessary state water permits. *Missouri River Basin Industrial Water Marketing: Hearing Before the Subcomm. on Energy Research and Water Resources of the Senate Comm. on Interior and Insular Affairs*, 94th Cong., 1st Sess., Part 1, at 4 (1975) ("1975 Senate Hearings") (App. 110a-112a). For the convenience of the Court, excerpts from the 1975 Senate Hearings are set out in the Appendix to this brief.

[6] Lake Oahe is one of the six federal reservoirs built along the main stem of the Missouri River. It has a capacity of approximately 23,500,000 acre feet and was built to provide storage for irrigation, flood control, navigation, hydroelectric power and other purposes. S. Doc. No. 247, 78th Cong., 2d Sess. 3 (1944) (App. 98a).

("the Corps"), which built and operates Lake Oahe, and after finding that the contract would not impair the irrigation function of the reservoir, the Secretary approved a forty-year contract with ETSI pursuant to Section 9 of the Flood Control Act of 1944 ("the Act") and Section 9(c) of the Reclamation Project Act of 1939, 43 U.S.C. § 485h(c) (1982) ("the Reclamation Act"). Thereafter, the Corps issued a permit allowing ETSI to construct a water intake structure to remove the water from Oahe.

B. The District Court's Decision

The States of Iowa, Missouri and Nebraska, the Kansas City Southern Railway, several farmers groups and the Sierra Club filed suit in the United States District Court for the District of Nebraska against ETSI, the Secretary, the Corps and a number of other federal agencies and officials, challenging the federal permits and approvals. One of the plaintiffs' many allegations was that the Secretary did not have authority under the Act to enter into the contract with ETSI.

The parties filed cross-motions for summary judgment on the question of the Secretary's authority. The district court determined that the Secretary lacked the necessary authority and enjoined the contract. While acknowledging that Section 9(c) of the Act gives the Secretary water marketing authority over "reclamation developments," the court posited three reasons for determining that the Secretary has no such authority over water stored for irrigation at the Missouri River main stem reservoirs. First, Lake Oahe was built and is operated by the Corps. Second, although Oahe contains substantial storage intended for irrigation, its dominant purpose is flood control, and it has not been used for irrigation. And third, even though Section 9(a) of the Act gives the Corps and Interior shared jurisdiction over each multiple-purpose reser-

voir according to their respective areas of expertise, Congress intended Interior's jurisdiction to extend only to irrigation distribution systems, not to the water stored for irrigation. In essence, therefore, the district court concluded that, unless the Secretary actually built irrigation *works*, he had no jurisdiction over irrigation *storage* at dams built and operated by the Corps. Pet. App. 54a-59a.

C. The Eighth Circuit's Decision

The Eighth Circuit affirmed by a divided vote, largely for the reasons offered by the district court. The majority asserted that the *only* relevant inquiry "is whether Lake Oahe is a reclamation development undertaken by the Secretary of the Interior pursuant to Section 9(c) of the Act." *Id.* 19a. Having thus framed the issue, the majority inevitably found that Lake Oahe as a whole was *not* a "reclamation development" because it was "undertaken and controlled by the agency with the dominant interest"—the Corps. *Id.* 21a. That being so, the majority concluded, the Secretary could not have jurisdiction over the irrigation water stored in Oahe because Oahe was not a "reclamation development."

In reaching this conclusion, the Eighth Circuit majority gave no weight to the Secretary's long-standing interpretation of the Act or to the subsequent congressional action affirming the Secretary's interpretation. Indeed, the court refused to give *any* deference to the Secretary's interpretation of the scope of his authority, reasoning that "[t]he limits of an administrative agency's statutory authority remains an issue suitable for judicial resolution." *Id.* 33a.

In dissent, Judge Bright concluded that the majority's approach and opinion turned the rule of deference on its head. Because the Secretary had consistently interpreted the term "reclamation development" in Section 9 of the Act to include irrigation water stored in Corps-operated

reservoirs, Judge Bright recognized that the question for the court was whether that was a reasonable interpretation. *Id.* 38a. Finding the Secretary's interpretation entirely reasonable and in accord with the concept of shared jurisdiction approved by Congress in Section 9 of the Flood Control Act, Judge Bright would have upheld the Secretary. *Id.* 36a. Judge Bright further noted that, because of the statutory limitations on the water marketing authority of the Secretary of the Army,[7] the majority's decision effectively left the irrigation storage of the main stem dams "without a governing agency or law." *Id.* 43a. Even worse, the decision renders "the irrigation water stored in the vast Oahe reservoir . . . unused and useless." *Id.* Judge Bright concluded that Congress "[s]urely . . . did not intend such incongruous consequences." *Id.*

On petition for rehearing en banc, the ten voting members of the Eighth Circuit were evenly divided. Accordingly, the majority opinion of the panel was left standing.

SUMMARY OF ARGUMENT

Section 9(a) of the Flood Control Act adopted a comprehensive plan for the development of Missouri Basin water resources. The plan assigned the Secretary of the Interior jurisdiction over and responsibility for reclamation features of the plan—including irrigation storage at the main stem reservoirs built and operated by the Corps. In carrying out his responsibilities under this comprehensive development plan, the Secretary is required by Section 9(c) of the Act to administer all "reclamation developments" in accordance with general reclamation law. Construing Sections 9(a) and 9(c) together, the Secre-

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[7] The Flood Control Act conferred jurisdiction on the "Secretary of War." Subsequently, however, the duties under the Act were assumed by the Secretary of the Army. All references herein will be to the Secretary of the Army.

tary properly contracted with ETSI for the use of excess irrigation storage at Lake Oahe.

The Secretary's action is supported not only by the terms of Section 9 and the development plan expressly incorporated therein, but also by the legislative history of the Act, the long-standing interpretation of the agency, and a recent reaffirmation by Congress of the scope of the Secretary's authority. Moreover, the Secretary's interpretation directly advances the three fundamental objectives of the development plan: maximum beneficial use of Basin water; functional division of authority between the two agencies charged with the plan's development; and flexibility to respond to changing conditions in the Basin.

The Secretary's interpretation of Section 9 was a reasonable resolution of a question Congress never squarely addressed—the proper disposition of irrigation storage in the absence of any irrigation demand at the main stem reservoirs. Thus, the Eighth Circuit was required to defer to the Secretary's resolution of this question.

In rejecting the Secretary's construction of Section 9, the Eighth Circuit erroneously fixed on Section 9(c)'s reference to "reclamation developments"—a term nowhere defined in the Act—and based solely on this term reasoned that the Secretary has authority over reclamation features only when he builds "irrigation works." This conclusion is directly contradicted by the plan adopted in Section 9(a), and it renders the vast excess irrigation storage of the main stem reservoirs beyond reach for any beneficial consumptive use. Such a result is completely at odds with the terms, policies and history of the Act and should not be accepted by this Court.

ARGUMENT

I. The Flood Control Act and the Reclamation Act Authorize the Secretary of the Interior to Market Excess Irrigation Water at Missouri River Main Stem Reservoirs.

The Secretary of the Interior premised his contractual authority in this case on Section 9 of the Flood Control Act. A careful reading of that Section, together with the House and Senate documents that were expressly approved in Section 9(a), makes clear that Congress intended the Secretary to have the authority to ensure the maximum beneficial use of the water stored for irrigation in Basin reservoirs. This interpretation is corroborated by the history of the Act and is fully consistent with the policies of the Act. It is further in accord with the Secretary's long-standing, consistent interpretation of the Act and a recent reaffirmation of that interpretation by Congress. The Eighth Circuit's refusal to consider all these indications of congressional intent—and its insistence on reading the words "reclamation developments" from Section 9(c) in a vacuum—caused it to misconstrue the Secretary's authority.

A. Section 9 of the Flood Control Act Adopted the Pick-Sloan Plan and Thereby Gave the Secretary Authority over All Reservoir Irrigation Features, Including Stored Irrigation Water at Lake Oahe.

Analysis of the scope of the Secretary's authority of course begins with the language of the law giving him that authority.[8] Here, that law is Section 9 of the Flood Control Act, an Act that authorized a nationwide program for the development of the country's water resources. Section 9 is addressed specifically and exclusively to Missouri River Basin development.

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[8] *See United States* v. *Turkette*, 452 U.S. 576, 580 (1981); *Consumer Product Safety Comm'n* v. *GTE Sylvania, Inc.*, 447 U.S. 102, 108 (1980).

Section 9(a) expressly adopted and approved the "general comprehensive plans" for the development of the Basin that were set forth in three documents: (1) the Pick Report, prepared by Colonel Pick of the Corps and published as H.R. Doc. No. 475, 78th Cong., 2d Sess. (1944); (2) the Sloan Report, prepared by Assistant Regional Director Sloan of Interior's Bureau of Reclamation and published as S. Doc. No. 191, 78th Cong., 2d Sess. (1944); and (3) the jointly-prepared reconciling report, S. Doc. No. 247, *supra*. These three documents together have become known as the Pick-Sloan Plan.[9]

The remaining provisions of Section 9 were designed to ensure implementation of the Pick-Sloan Plan adopted in Section 9(a). Section 9(b) directed the Secretary of the Army to carry out those parts of the Plan that were assigned to him. And Section 9(c) specified that, "[s]ubject to the basin-wide findings and recommendations regarding the benefits, the allocations of costs and the repayments by water users" set forth in the Pick-Sloan documents, the Secretary of the Interior was to undertake the various "reclamation developments" assigned to him "under said plans" in accordance with the general reclamation laws.[10] The latter laws govern Interior's administration of irrigation and other beneficial consumptive uses of water at all Bureau of Reclamation projects.

Through its adoption of the terms of the Pick-Sloan Plan in Section 9(a), Congress defined the Secretary's authority in the Missouri Basin development. Through Section 9(c), Congress identified the laws that govern the Secretary's exercise of that authority. Because the issue before the Court is the scope of the Secretary's authority, ETSI begins its analysis with the "general com-

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[9] For the convenience of the Court, pertinent portions of these three House and Senate documents are set out in the Appendix to this brief.

[10] Sections 9(d) and 9(e) authorized appropriations for the implementation of the initial stages of the Pick-Sloan Plan.

prehensive plans" expressly adopted in Section 9(a). Those plans define the Secretary's authority as surely as if their words were found in Section 9 itself.[11]

1. *The Pick Report*

Prepared by the Corps at the request of Congress after a series of devastating floods in the Basin, the Pick Report focused primarily on improving flood control. Nevertheless, the report also acknowledged the desirability of multiple-purpose reservoirs, which would provide "for the most efficient utilization of the waters of the Missouri River Basin for all purposes," and thereby tend to stabilize "the economic life of the valley and . . . interstate commerce" as well as encourage "industrial and civic developments." H.R. Doc. No. 475, at 29 (App. 46a).

Contrary to the lower courts' rulings, the Pick Report in no way suggested that the Corps would have exclusive control over the reservoirs it built, nor that the Secretary of the Interior's jurisdiction at the main stem reservoirs would be limited to irrigation uses of water. Instead, recognizing "the broad and important interests and responsibilities of the Bureau of Reclamation in the Missouri River Basin," the Corps noted in the Pick Report

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[11] When it was considering the bill, Congress recognized that the provisions of the Plan would be the law that governed Missouri Basin development. During the Senate hearings, Colonel Reber of the Corps, addressing one of the specific recommendations of the Pick Plan, noted that, if the bill were passed, that recommendation "will become a part of the basic law." *See Flood Control: Hearings on H.R. 4485 Before a Subcomm. of the Senate Comm. on Commerce*, 78th Cong., 2d Sess. 667 (1944) ("1944 Senate Hearings"). In a similar vein, Senator Overton, one of the principal sponsors of the bill, noted that "the Pick plan is already in the House bill." *Id.* at 506. Likewise, Senator Robertson asked Senator Overton whether he also intended to have "the Sloan plan incorporated in this bill." *Id.* at 515-16. Ultimately, of course, the Sloan Report, like the Pick Report, was incorporated in the bill, and it too thereby became part of the "basic law" governing Missouri Basin development.

that it would "continue to plan its work in that basin so as to coordinate fully the activities of both agencies." *Id.* at 3 (App. 7a). Consistent with this objective, in transmitting the report to Congress, Major General Reybold, Chief of Engineers for the Corps, proposed a system of *shared* jurisdiction to govern Basin reservoirs. He stated that, while the Corps should retain responsibility for all matters related to flood control and navigation, the Bureau of Reclamation should have full responsibility for the utilization of storage provided for irrigation—*regardless of which agency was operating a particular reservoir*:

> Tributary reservoirs should, when advisable from the standpoint of basin-wide development, be constructed, operated, and maintained by the agency with the dominant interest under existing law. It is essential, however, that the mainstem projects be built, operated, and maintained by the Corps of Engineers, and that utilization of storage reserved for flood control in all multiple-purpose reservoirs on tributaries be in accordance with regulations prescribed by the Secretary of [the Army]. . . . Conversely, *utilization of storage reserved for irrigation in all multiple-purpose reservoirs should be in accordance with regulations prescribed by the Secretary of the Interior.*

Id. at 3-4 (emphasis added) (App. 7a-8a).

2. *The Sloan Report*

The Sloan Report, prepared by the Bureau of Reclamation, was the product of a five-year study of the physical features and the existing and expected economic development of the entire Basin. In the report, the Bureau stressed the broad range of purposes its study was intended to serve:

> It is a *comprehensive plan for the highest beneficial use of the waters of the basin.* It provides for flood control, navigation, irrigation, power development, *domestic and industrial water supplies*, silt control,

> recreational use of waters, conservation of fish and wildlife, and pollution abatement, and will assist in the restoration and maintenance of groundwater levels and inland lakes.

S. Doc. No. 191, at 10 (emphasis added) (App. 67a). Recognizing the need for flexibility in such an undertaking, the Sloan Report proposed a plan "adapted to development in stages, and to such modifications as changes in physical and economic conditions make necessary." *Id.* at 17 (App. 79a).

Significantly, the Sloan Report like the Pick Report, expressly provided that the Corps and the Bureau should play coordinate roles in developing Missouri River Basin projects, with authority allocated *by function*:

> *The agency with primary interest in the dominant function of any feature proposed in the plan should construct and operate that feature,* giving full recognition, in the design, construction, and operation, to the needs of other agencies with minor interests. All reservoirs where flood control and navigation are dominant should be operated by the Corps of Engineers, and where the flood control and navigation functions are minor, the reservoirs should be operated in accordance with regulations of the Corps so far as flood control and navigation are concerned. *All irrigation features should be operated by the Bureau of Reclamation or its agents.* All reservoirs in which irrigation, restoration of surface and ground waters, or power, is dominant, should be operated by the Bureau of Reclamation. *Where these functions are minor, the reservoirs should be operated under regulations of the Bureau of Reclamation so far as such functions are concerned.*

S. Doc. No. 191, at 11 (emphasis added) (App. 68a).

In the Corps' formal comments on the Sloan Report, Major General Reybold reemphasized his agreement with this view: "In *all reservoirs*, utilization of storage for flood control should be in accordance with regulations

prescribed by the Secretary of [the Army] and *utilization of storage for irrigation should be in accordance with regulations prescribed by the Secretary of the Interior.*" *Id.* at 8 (emphasis added) (App. 63a).

3. *The Pick-Sloan Plan*

Although the Pick and Sloan Reports thus espoused the same broad concepts, they differed as to the details of various Basin projects. Accordingly, the Senate asked representatives from the Corps and the Bureau to undertake a further report reconciling those differences and recommending a unified approach to the development of the Missouri River Basin. 1944 Senate Hearings at 516-25. Senate Document No. 247, the third document adopted and approved for implementation in Section 9(a) of the Flood Control Act, reflects the results of the joint committee's work.

The joint report began by emphasizing that, in reconciling those differences that had existed between the Pick and Sloan Reports, the committee had been guided by the "basic principle" of allocating responsibility between the Bureau and the Corps at each reservoir based on the functions to be carried out at the reservoir.[12] The committee further recognized that it had been charged with developing a plan "to more fully utilize the water re-

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[12] Senate Document No. 247 states:

> It was possible to bring into agreement the plans of the Corps of Engineers and the Bureau of Reclamation by recognizing the following basic principles:
>
> (a) The Corps of Engineers should have the responsibility for determining main stem reservoir capacities and capacities of tributary raservoirs for flood control and navigation.
>
> (b) The Bureau of Reclamation should have the responsibility for determining the reservoir capacities on the main stem and tributaries of the Missouri River for irrigation, the probable extent of future irrigation, and the amount of stream depletion due to irrigation development.

Id. at 1 (App. 94a).

sources of the basin and to most effectively serve the present and ultimate requirements of flood control, irrigation, navigation, hydroelectric power, and other uses." *Id.* at 3 (App. 97a).

Employing these basic principles, the committee agreed on a single plan for the Basin. For Lake Oahe, the Pick Report had originally proposed a capacity of 6,000,000 acre feet in order to meet flood control needs. S. Doc. No. 247, at 2 (App. 96a). The Sloan Report, however, had placed greater emphasis on the multiple-purpose possibilities of Oahe and, in particular, on its irrigation potential. Thus, it had recommended that Oahe be built with a capacity of 19,600,000 acre feet to allow the reservoir to be used for a major irrigation project in South Dakota's James River Basin. S. Doc. No. 191, at 115-16 (App. 91a-92a). The final plan accepted the Bureau of Reclamation's recommendations for Lake Oahe, stressing the broad range of functions the expanded version of the reservoir could serve:

> The selection of the high Oahe Dam, Reservoir, and power plant as proposed in Senate Document 191 . . . is required in connection with the irrigation of 750,000 acres of land in the James River Basin as well as to provide useful storage for flood control, navigation, the development of hydroelectric power, and other purposes.

S. Doc. No. 247, at 3 (App. 98a).

The foregoing demonstrates that, although the Pick-Sloan documents adopted by Congress differed as to certain details, they were in complete harmony as to three fundamental policies. First, Basin development should promote the maximum beneficial use of water in the region. Second, there should be coordinate and cooperative jurisdiction at Basin reservoirs, *i.e.*, jurisdiction was *not* to be allocated on the basis of which agency built a particular reservoir, but rather each agency was assigned responsibility at *each* multiple-purpose reser-

voir according to the functions within that agency's areas of expertise. Finally, the development plan was designed to be flexible and to be implemented in light of changing circumstances by the two jointly responsible agencies.

The Secretary advanced all three of these policies when he contracted with ETSI for an industrial use of excess irrigation storage. Although Pick-Sloan anticipated that Oahe would serve a substantial irrigation purpose, because that demand has not developed, the Secretary exercised his ancillary authority under the reclamation laws to make irrigation storage available for other beneficial consumptive uses. In so doing, he promoted the maximum beneficial use of the water, exercised his authority over the reservoir's irrigation features, and adapted Basin development plans to the unexpected lack of irrigation demand. Furthermore, he carried out Congress' intent that the government be reimbursed for the reclamation storage provided in the Basin. Finally, and perhaps most significantly, he fulfilled his responsibility under Section 9(a) to administer the irrigation features of a multiple-purpose reservoir in accordance with the reclamation laws made applicable by Section 9(c). The Secretary's authority to enter the ETSI contract is therefore clearly established by the terms of Section 9.

B. The Legislative History Fully Supports the Secretary's Interpretation of Section 9 of the Flood Control Act.

The legislative history of Section 9 confirms that Congress intended the Secretary to administer the irrigation storage at Lake Oahe in accordance with the reclamation laws and, more particularly, that he had the authority to contract with ETSI for an industrial use of excess irrigation storage.

During the debates on the bill, Representative Whittington, Chairman of the House Committee on Flood

Control, for example, emphasized that "public policy requires not only that flood-control storage be under the supervision of the Secretary of [the Army] and the Chief of Engineers but also *that storage for the reclamation of arid lands be under the supervision of the Secretary of the Interior.*" 90 Cong. Rec. 4127 (1944) (emphasis added). He in no way suggested that the Secretary of the Interior's authority was limited to instances in which water was being used in irrigation "works." Rather, he noted that the bill gave the Secretary the power to administer *both* "reclamation *and* the disposal of reclamation waters provided by the projects authorized in this bill." *Id.* at 4126 (emphasis added). Representative Curtis from Nebraska, another major sponsor of the legislation, likewise noted that the Act "gives the Bureau of Reclamation jurisdiction over the irrigation features of the reservoirs and the distribution systems." *Id.* at 4130.

President Roosevelt himself supported the policy of shared jurisdiction over Missouri Basin projects. In a letter to Congress at a time when the Bureau and the Corps were debating which of them should have control over particular projects, the President urged:

> No matter which agency builds a multiple-purpose structure involving in even a minor way the interests of the other, *the agency with the responsibility for that particular interest should administer it in accordance with its authorizing legislation and general policies.* For example, the Bureau of Reclamation . . . should administer, under the reclamation laws and its general policies, those irrigation benefits and phases of projects built by the Corps of Engineers.

Id. at 8623 (emphasis added). Senator O'Mahoney subsequently explained that it was the intervention of the President that brought about agreement between the Corps and the Bureau on a plan for shared control over the Missouri River Basin. *Id.* at 8489. And just before

final passage, Senator Overton, one of the principal sponsors and managers of the bill, stressed: "No project in this bill which may include irrigation features is exempted from the reclamation laws." *Id.* at 9264.

Similar views were expressed in the Senate hearings. Secretary of the Interior Ickes stressed that "the essence" of his Department's recommendations was "to provide for the development of the Nation's water resources on a basis that will encourage the maximum utilization of all their possible benefits . . . [and] to assure that the *benefits of waters conserved for irrigation* or for power *shall be distributed as widely as possible* among the people." 1944 Senate Hearings at 463 (emphasis added). Colonel Reber of the Corps pointed out the need to apply the plan flexibly to respond to changing conditions:

> Although I certainly hesitate very much to even appear to pose as a prophet, I venture to say that all of the details of this great Missouri program will not be worked out for 10 years or 20 years or even more. Then, when we have finally worked out all those details, I am sure we may not even recognize some of those details when we compare them with what we started with today. . . . That is why we must keep the over-all plan for the Missouri flexible.

Id. at 668-69.

The legislative history of the Act also demonstrates that, in incorporating the federal reclamation laws in Section 9(c) of the Act, Congress clearly knew that those reclamation laws gave the Secretary the power to market water for non-irrigation purposes. Only a few years before, Congress had amended the reclamation laws to authorize the Secretary "to enter into contracts to furnish water for municipal water supply or miscellaneous purposes," provided the contracts "will not impair the efficiency of the project for irrigation purposes." Section 9(c), Reclamation Act, 43 U.S.C. § 485h(c). In the House debates on what ultimately became Section 6 of

the Flood Control Act, Representative Whittington expressly noted the Secretary's broad reclamation authority and argued that the Corps should be granted a similar authority with respect to water under its jurisdiction:

> Section [6] provides that if there is a town or a city or a municipality that needs an additional water supply . . . the Chief of Engineers shall have the right to provide that that water shall be used there for the purpose of supplying the needs of man. It strikes me that *that provision is a power that now obtains under the reclamation law.* If it obtains under the reclamation law, I know of no good reason why it should not obtain in the existing bill.

90 Cong. Rec. 4125 (1944) (emphasis added).

Indeed, in presenting its Sloan Report to Congress, the Bureau of Reclamation highlighted the fact that its plan was designed to serve a host of non-agricultural purposes, including industrial water supply:

> To the extent that the several functions of water control and utilization are conflicting, preference should be given to those which make the greatest contribution to the well-being of the people and to the areas of the greatest need. To the extent that the uses of water are competitive, *the use of water for domestic, agricultural, and industrial purposes should have preference. The plan would meet these objectives.*

S. Doc. No. 191, at 10 (App. 67a-68a) (emphasis added). If Congress had intended to prohibit this use of irrigation storage in the main stem reservoirs of the Missouri Basin, it would surely not have provided for the wholesale incorporation of the federal reclamation laws in Section 9(c) of the Flood Control Act. Nor would it have repeatedly indicated its understanding that the Secretary would apply the reclamation law to all irrigation features of Basin developments. Accordingly, the legislative history confirms the Secretary's contracting authority over Oahe's irrigation storage.

C. A Consistent History of Agency Interpretation, Concurred in by the Corps and Accepted by Congress, Supports the Secretary's View of the Scope of His Authority over Irrigation Storage in the Main Stem Reservoirs.

The Secretary's understanding that he has full authority to contract for non-irrigation uses of the irrigation storage at Lake Oahe is further supported by a long history of consistent agency interpretations. These interpretations have taken the form of testimony before Congress, formal legal opinions, a Memorandum of Understanding ("MOU") with the Secretary of the Army and a series of contracts similar to the ETSI contract. Moreover, the Secretary's interpretation has been repeatedly reviewed and approved by Congress.

1. *The Secretary's Interpretations Prior to 1974*

Although the precise question of the Secretary's industrial water marketing authority at Corps-operated reservoirs did not arise until 1974, the Secretary confronted several related questions prior to that time and on each occasion his interpretation of the Act was fully consistent with his interpretation in this case.

For example, at Senate oversight hearings in 1957 concerning the treatment of revenues from power production at Missouri Basin projects, Edward Weinberg, Assistant Solicitor for the Department, explained in detail Interior's view that Section 9(c) of the Flood Control Act did not simply adopt the plans for the physical structures called for by the Pick-Sloan Plan—the view the Eighth Circuit espoused in this case—but, rather, fully incorporated federal reclamation law with respect to all reclamation and power aspects of the development project. By virtue of that incorporation, Interior had concluded that all revenues from power generation at Basin projects—both Corps-operated and Bureau-operated—were to be used to

reimburse project costs attributable to irrigation.[13] It was, of course, this same understanding that led the Secretary to conclude that the Section 9(c) industrial water marketing authority he indisputably has over irrigation storage at Bureau of Reclamation-built reservoirs [14] likewise applies to such storage at Corps-built projects.

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[13] *Missouri Basin Water Problems: Joint Hearings Before the Senate Comm. on Interior and Insular Affairs and the Senate Comm. on Public Works*, 85th Cong., 1st Sess., Part 2, at 313-353 (1957) (1957 Senate Hearings). In reaching this conclusion, Interior placed great weight on the terms of the Pick-Sloan documents:

> Senator Case: Well, just a minute. Section 9(c) [of the Flood Control Act] does not go to the physical structures only.
>
> Mr. Weinberg: Oh, no.
>
> Senator Case: It says: "subject to the recommendations regarding the benefits, the allocations of costs, and the repayments by water users made in such documents."
>
> Mr. Weinberg: That is correct. And that is the premise upon which the Secretary concluded that the power from these Army structures was to be marketed under reclamation law for the purpose of meeting the irrigation costs from these irrigation developments that were beyond the repayment ability of the water users. That is the significance of the basin-wide findings and recommendations.

1957 Senate Hearings at 318.

[14] *Environmental Defense Fund, Inc.* v. *Morton*, 420 F. Supp. 1037 (D. Mont. 1976), *aff'd in pertinent part sub nom. Environmental Defense Fund, Inc.* v. *Andrus*, 596 F.2d 848 (9th Cir. 1979), confirms that Section 9(c) of the Reclamation Act, as incorporated in Section 9(c) of the Flood Control Act, authorizes the Secretary to market excess irrigation storage in the multiple-purpose reservoirs of the Missouri Basin for industrial use. The contracts at issue there involved water stored in reservoirs built by the Bureau of Reclamation. The district court found in the Pick-Sloan Plan a congressional intent both to ensure that "all beneficial uses of water could be accommodated" and to provide "sufficient flexibility to meet unforeseen changes in the physical and economic conditions of the area." 420 F. Supp. at 1041. It thus concluded that "the sole consideration for the Secretary" was "whether industrial water use will impair the efficiency of the projects for irrigation purposes." *Id.* at 1045. Because the Secretary had found, as he did when he

In 1958, the Secretary sought confirmation from the Attorney General that the Bureau of Reclamation had full jurisdiction over waters stored for irrigation in any Corps-operated reservoir constructed pursuant to the Act. In response, the Attorney General confirmed the Secretary's jurisdiction and expressly rejected the theory that that jurisdiction was limited to circumstances where the Secretary had constructed "irrigation works." 41 Op. Att'y Gen. 377 (1958).

2. *The Secretary's 1974 Interpretation*

In 1974, the Secretary and the Corps began to explore the feasibility of employing Missouri Basin water resources to develop the Nation's energy resources. As part of that effort, the Secretary was required to confront the question of his authority to market excess irrigation storage for industrial use. In an opinion prepared at the request of the Secretary, the Interior Solicitor concluded that the Secretary has industrial marketing authority over all Missouri Basin excess irrigation storage, including storage at the Corps-built main stem reservoirs:

> It is clear that where capacity has been included in the main stem reservoirs at the request of the Bureau of Reclamation for irrigation and municipal and industrial purposes, the water available from such capacity is to be marketed for such purposes by the Bureau of Reclamation under the Reclamation laws, just as the hydroelectric power generated at those reservoirs is now being marketed by the Bureau of Reclamation under the Reclamation laws.

J.A. 124.[15]

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approved the ETSI contract, that there would be no impairment, the court held: "the Bureau was authorized by the 1944 Act and the Reclamation Project Act of 1939 to enter into the subject contracts." *Id.* at 1043. The Ninth Circuit affirmed this holding on the basis of the district court's "comprehensive opinion." 596 F.2d at 850.

[15] The Solicitor's opinion relied on Section 9(c) of the Flood Control Act, Section 9(c) of the Reclamation Act and the terms of the Pick-Sloan Plan. J.A. 120-22.

At about the same time, the Corps likewise addressed the question of the Secretary's industrial water marketing authority. As had the Interior Solicitor, the Acting General Counsel of the Army concluded that the Secretary has that authority under Section 9(c) of the Flood Control Act and Section 9(c) of the Reclamation Act. J.A. 132-133. The Army opinion noted that Section 9(c) of the Flood Control Act "made plain that the use of the storage for 'reclamation and power' purposes falls under the aegis of the Secretary of Interior." J.A. 132. It further acknowledged that "[r]eclamation law grants the Secretary of Interior general authority to market water for municipal and industrial purposes so long as such marketing 'will not impair the efficiency of the project for irrigation purposes.'" J.A. 133.

Throughout this litigation, the respondents have attempted to use the Army opinion to their advantage, pointing to a single footnote which states that the Secretary could not carry out a water marketing program independently. J.A. 135. They ignore, however, the limited role the Army General Counsel described for the Corps: ensuring that industrial uses of water from the main stem reservoirs would not interfere with flood control operations. *Id.* The Secretary of the Army performed that function in 1975, when he joined with the Secretary of the Interior in concluding that one million acre feet of water could be made available for energy/industrial use without injuring other project purposes, including flood control. 1975 Senate Hearings at 6 (App. 116a).[16]

The Corps has thus had full input with respect to the one matter that the Army General Counsel noted was

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[16] In addition, before issuing a permit to ETSI allowing it to withdraw from Lake Oahe the water for which it had contracted, the Corps prepared an environmental assessment addressing impacts on navigation, hydropower generation and other project uses. A.R. 930,314. That assessment identified no adverse effects on flood control.

within its purview. The remaining water contracting requirements are those imposed by Section 9(c) of the Flood Control Act and Section 9(c) of the Reclamation Act. The Corps has no role to play under those statutory provisions. Accordingly, the 1974 opinion of the Army General Counsel confirms the validity of the ETSI contract.

3. *The 1975 Memorandum of Understanding*

The opinions of the Interior Solicitor and the Army General Counsel provided the legal support for the MOU that the Secretary of the Interior and the Secretary of the Army executed in 1975. In the MOU, the two departments agreed to engage in a cooperative effort for the marketing of excess irrigation storage in the main stem reservoirs of the Missouri Basin in order to "expedite the use of water for energy development." J.A. 136. Consistent with the allocation of responsibility under the Pick-Sloan Plan, the MOU specified that the Secretary of the Interior was to "determine the amounts of water available from the capacity provided in the main stem reservoirs for irrigation," and the Secretary of the Army was to "determine how much of the water determined by the Secretary of the Interior to be excess to present irrigation needs can be made available for industrial uses" without interfering with the operation of the reservoirs for flood control. *Id.* Interior was to serve as the contracting authority, while the Army was to retain operational control over the reservoirs. *Id.*

After the two departments announced the signing of the MOU, the Senate Subcommittee on Energy Research and Water Resources, exercising its oversight responsibility, posed a series of questions to the two Secretaries concerning the authority underlying the MOU and the availability of water in the main stem reservoirs to carry out the program. In their joint response, the departments explained that they were relying on Interior's authority

to execute contracts for municipal and industrial uses of water pursuant to Section 9(c) of the Flood Control Act and Section 9(c) of the Reclamation Act. 1975 Senate Hearings at 5 (App. 114a). They further explained that, of the two million acre feet of main stem reservoir storage that reclamation studies had shown would not be needed for irrigation until at least 2023, they proposed initially to make one million acre feet available for interim industrial use. *Id.* at 6 (App. 115a-116a). They also specifically noted the pending ETSI request for water for use in its coal slurry pipeline. *Id.*

Thus, these hearings focused Congress' attention on the statutory basis for the water marketing program—precisely the same statutory grant of authority that is at issue here. Thereafter, Congress took no action to change those provisions or to otherwise restrict Interior's authority to execute water service contracts for industrial uses of irrigation storage.

The MOU had an initial term of two years, and it was extended once. J.A. 136-139. Only one water service contract was executed while the MOU was in effect.[17] After the MOU expired, however, Interior announced that it would continue the industrial water marketing program independently, following the principles established in that document and relying on the same statutory grant of authority. Two further contracts,[18] one of which is the ETSI contract, were executed after the MOU expired and before the district court ruled in this matter that the Secretary did not have the requisite authority. The other contracts were not challenged. Accordingly, the MOU and Congress' review thereof provides further support for the Secretary's authority.

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[17] J.A. 145 (contract with Basin Electric Power Cooperative for 19,000 acre feet of water from Lake Sakakawea).

[18] J.A. 146 (contract with ANG Coal Gasification Company for 17,000 acre feet of water also from Lake Sakakawea); J.A. 224 (ETSI contract).

4. *Congress' 1982 Confirmation of the Secretary's Interpretation*

The most recent evidence that the Secretary has properly determined the scope of his authority is found in Section 212(b) of the Reclamation Reform Act of 1982, Pub. L. No. 97-293, 96 Stat. 1261. In that legislation, Congress expressly preserved Interior's authority to enter into water service contracts in order to obtain repayment of the construction, operation and maintenance costs of Corps projects "allocated to *conservation storage* or *irrigation storage*." 43 U.S.C. § 390*ll*(b) (1982) (emphasis added).[19]

Section 212(b) of the 1982 Act was the subject of detailed discussion on the Senate floor because it was intended to address the concern of many in Congress that other provisions of the bill might undercut the government's ability to recoup costs at Corps projects that had been allocated to reclamation.[20] Both Interior and the Corps advised the Senate that Section 212(b) would fully protect Interior's ability to obtain reimbursement of the reclamation costs of such projects. Commissioner of Reclamation Broadbent explained:

> In regard to the existing and future repayment obligations for costs of Corps projects allocated to irrigation, it is our understanding and belief that [*Section 212(b)*] *would continue in effect the provisions of law requiring the repayment of costs of Corps of Engineers projects allocated to irrigation.*

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[19] *See also* S. Rep. No. 373, 97th Cong., 2d Sess. 12, 15-16, *reprinted in* 1982 U.S. Code Cong. & Admin. News 2570, 2576, 2579-80.

[20] Congress was particularly concerned about the effect on reclamation cost recovery of those provisions designed to free lands irrigated through privately-built irrigation works at Corps reservoirs from the acreage restrictions of the reclamation laws. *See* Section 212(a) 43 U.S.C. § 390*ll*(a) (1982); S. Rep. No. 373 at 10, 16, *reprinted in* 1982 U.S. Code Cong. & Admin. News 2570, 2573, 2580.

128 Cong. Rec. 16607 (1982) (emphasis added). He added that Section 212(b) "assure[s] that the Secretary of the Interior's authority to contract with water users for irrigation water supplies from Corps of Engineers projects continues in effect and is not inhibited in any way." *Id.*

General Heiberg of the Corps concurred in Interior's understanding of Section 212(b), noting "enactment of the section would not result in the United States foregoing any intended repayment revenues for water storage allocated to irrigation anywhere in the United States." *Id.* at 16609. He also noted: "[i]t is general Corps policy to apply Reclamation law to those projects in the 17 western states which have irrigation as an authorized purpose." *Id.* Finally, he explained that, after such projects become operational, "the irrigation feature is normally turned over to [the Bureau of Reclamation] so it can market the water in accordance with its policies and procedures." *Id.*

General Heiberg also provided Congress with a detailed analysis of the reimbursement status of costs allocated to irrigation features at Corps-operated reservoirs, including the Missouri River main stem reservoirs. In that analysis, he emphasized that some reimbursement would come from industrial users: "A portion of the main stem storage space set aside for irrigation has been contracted for by industrial water users for interim water supplies which will bring a substantial amount of revenue to the United States." *Id.* at 16611.

General Heiberg was, of course, referring to the ETSI contract and others like it. In passing Section 212(b), Congress not only accepted the Secretary's interpretation of the scope of his authority under the Flood Control Act, but specifically reaffirmed it.

D. The Eighth Circuit's Decision Contradicts Every Significant Indication of Congress' Intent.

As the foregoing discussion demonstrates, Section 9 of the Flood Control Act, the Pick-Sloan documents incorporated therein, the legislative history of the Act, the long-standing interpretation of both Interior and the Corps and Congress' recent confirmation of that interpretation all point to the same conclusion: the Secretary has authority to administer the irrigation storage of the main stem reservoirs in the Missouri Basin in accordance with the reclamation laws.

The Eighth Circuit ignored virtually all of these indications of Congress' intent, focusing its analysis almost exclusively on Section 9(c)'s provision that "the reclamation and power developments to be undertaken by the Secretary of the Interior . . . shall be governed by the Federal Reclamation laws." Based on this single phrase, the majority asserted that "[t]he inquiry in this case then is whether Lake Oahe is a reclamation development undertaken by the Secretary of the Interior . . . ." Pet. App. 19a. Relying on the undisputed fact that Lake Oahe was built and it operated by the Corps, the court concluded that it is not a "reclamation development" and that the Secretary therefore did not have authority to approve the ETSI contract. This reading of Section 9(c) is untenable for a number of fundamental reasons.

First, construing Section 9(c) to give the Secretary authority only over irrigation works that he builds and operates renders Section 9 internally inconsistent. Congress expressly approved the Pick-Sloan Plan in Section 9(a) and, as demonstrated above, that Plan clearly specified that the Secretary of the Interior was to exercise jurisdiction over all Basin storage reserved for irrigation, not just over irrigation projects constructed by the Bureau.

Second, the Eighth Circuit's construction of Section 9(c) directly contradicts Congress' intent, made plain in

the legislative history, that the reclamation laws apply to all irrigation features of all Basin reservoirs—not just to Bureau-built reservoirs or to irrigation "works" at Corps reservoirs.

Third, the Eighth Circuit's construction is completely contrary to the three policies motivating the adoption of Section 9—that the functional expertise of each agency should be applied at each reservoir; that maximum beneficial use of the water be achieved; and that in achieving that maximum beneficial use the two agencies remain flexible to meet changing circumstances. The ETSI contract furthers all three of these policies, while the Eighth Circuit's decision undermines them all.

Fourth, the Eighth Circuit ignored Congress' review and approval of the Secretary's long-standing construction of his authority. That review and approval, occurring both in the MOU hearings and in the 1982 amendments to the reclamation laws, made clear Congress' acceptance of the Secretary's marketing authority over all Basin irrigation storage.

Fifth, the Eighth Circuit's construction of the statute produces numerous anomalous results that Congress could not have intended. For example, under the Eighth Circuit's analysis, irrigation storage at Bureau-built reservoirs is subject to the reclamation laws, but such storage at Corps-built reservoirs is not. The Eighth Circuit suggested no reason why Congress would have made such a distinction; neither did it indicate what law, if any, *does* govern irrigation storage at Corps-built reservoirs.

Similarly, under the Eighth Circuit's approach, irrigation "works" may be subject to the reclamation laws, but irrigation storage is not; again, however, the Eighth Circuit suggests no reason why Congress would have drawn such a distinction, nor any hint of what law governs such irrigation storage if the reclamation laws do not. Plainly, the reclamation laws themselves make no such distinc-

tions, but instead provide comprehensive treatment for administering irrigation storage and irrigation works alike.

In short, under the Eighth Circuit's decision, the Secretary has been deprived of his Section 9(a) authority to administer the irrigation features of the main stem reservoirs, at least until some irrigation demand develops or the Secretary builds a pointless irrigation "work."[21] As a consequence, the water cannot be used for the other beneficial purposes authorized by the reclamation laws and contemplated in the Pick-Sloan Plan. In addition, the recoupment of costs allocated to irrigation—a central feature of reclamation law indisputably intended to apply to Lake Oahe—will be thwarted indefinitely. Clearly, Congress did not intend such results.

[21] The Eighth Circuit seemed to view this case as nothing more than a debate over which of two federal agencies is the appropriate marketing authority for irrigation water stored in Corps-operated reservoirs. The majority erroneously assumed that the Corps has such authority under Section 6 of the Act. In fact, however, virtually no water stored in the main stem reservoirs can be made available under Section 6. That section permits the Corps to contract only "for domestic and industrial uses for surplus water that may be available at any reservoir under the control of the [Corps]: *Provided*, That no contracts for such water shall adversely affect then existing lawful uses . . . ." 33 U.S.C. § 708 (1982). The described "surplus water" is either water never earmarked for a particular purpose, 90 Cong. Rec. 4133 (1944) (remarks of Rep. Curtis), or water not currently being used for any authorized project purpose. Corps of Engineers Project Purpose Planning Guidance, Regulation ER 1105-2-20, § 7-3(c) (Jan. 29, 1982) (J.A. 207). The water ETSI contracted for is not "surplus" under either definition. It was originally earmarked for irrigation and, in the interim, runs through the turbines at the Oahe dam to generate hydroelectric power; both irrigation and power generation are authorized project purposes. For this reason, the Army has expressly determined that it is not free to market such water under Section 6 of the Act. J.A. 209-210. The Eighth Circuit's decision therefore contradicts the construction of the Act of both agencies charged with its administration.

Finally, even if this Court accepted the Eighth Circuit's view that the term "reclamation development" should be considered apart from all the other indications of Congress' intent, the irrigation storage at Lake Oahe still should be held to constitute such a "development." Oahe was built in accordance with the Bureau of Reclamation's Sloan Report with sufficient capacity to irrigate 750,000 acres of land in the James River Basin.[22] In other words, it is a much larger reservoir than would have been necessary had it been built to serve only a flood control function as originally envisioned in the Pick Report. In approving the Pick-Sloan Plan, Congress had before it cost allocation and repayment projections which anticipated that a substantial portion of its construction costs would be recovered under the repayment provisions of reclamation law. Indeed, the Sloan Report estimated that more than seventy-five percent of the benefits realized from the plan it proposed and more than forty percent of the repayment from the reimbursable features of the plan would be allocable to the irrigation features of the projects. S. Doc. 191, at 27 (App. 90a).[23] Furthermore,

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[22] S. Doc. No. 191, at 115-16 (App. 91a-92a); S. Doc. No. 247, at 3 (App. 98a). In 1968, Congress appropriated funds for construction of the initial stage of what became known as the Oahe Unit, a project that would have provided for irrigation of 190,000 acres in the James River Basin. Pub. L. No. 88-442, 78 Stat. 446 (1964); Pub. L. No. 90-453, 82 Stat. 624 (1968). Construction began on the Oahe Unit, but the project was later suspended. In 1982, Congress authorized the Bureau to terminate the entire project. WEB Rural Water Development Project Act of 1982, Pub. L. No. 97-273, §§ 3a and 4, 96 Stat. 1181, 1182. As a result, none of the water storage provided in Lake Oahe for irrigation in the James River Basin has been used for that purpose, nor will it be for the foreseeable future.

[23] Of the 60,000,000 acre feet of storage planned for the main stem reservoirs, only 10,000,000 acre feet were necessary to meet the flood control objectives of the Pick-Sloan Plan and only another 10,000,000 acre feet of water were necessary to maintain navigation. The irrigation features of the reservoirs represented the largest single use for which storage was being allocated in the entire Plan. 1944 Senate Hearings at 670-74, 728-36.

at Lake Oahe alone, 18.1 percent of the project's total costs are allocated directly to irrigation. 128 Cong. Rec. 16610 (1982). In such circumstances, this significant irrigation-related undertaking at Oahe easily merits the characterization "reclamation development."

Accordingly, on no reasonable construction of Section 9 can the Eighth Circuit's analysis be sustained. Its judgment should be reversed and the Secretary's construction upheld.

II. The Secretary's Construction of His Section 9 Authority Was Reasonable and Therefore Entitled to Deference.

For the reasons previously stated, ETSI believes the Secretary's long-standing construction of Section 9 was clearly correct and for that reason should have been accepted by the Eighth Circuit. But even if the Court believes there is more than one plausible construction of Section 9, the Eighth Circuit erred in substituting its own construction for that of the Secretary. The Secretary was applying a statute that it is his duty to administer and as to which he has considerable experience administering. In such circumstances, so long as the Secretary's construction was *a reasonable* one—which it clearly was in this case—the Eighth Circuit was bound to follow it.

In *Chevron U.S.A., Inc.* v. *Natural Resources Defense Council, Inc.*, 467 U.S. 837, 842-43 (1984), this Court held that:

> When a court reviews an agency's construction of the statute which it administers, it is confronted with two questions. First, always, is the question whether Congress has directly spoken to the precise question at issue. If the intent of Congress is clear, that is the end of the matter . . . . If, however, . . . Congress has not directly addressed *the precise question at issue*, the court does not simply impose its own construction on the statute . . . . Rather, . . . the ques-

> tion for the court is whether the agency's answer is based on a permissible construction of the statute. [Footnotes omitted; emphasis added.]

This Court has reiterated the *Chevron* rule in numerous subsequent decisions. Thus, in *United States* v. *Riverside Bayview Homes, Inc.*, 106 S. Ct. 455, 461 (1985), the Court held that, where an agency's interpretation does not conflict with the "expressed intent of Congress," judicial "review is *limited* to the question whether [the interpretation] is *reasonable*, in light of the language, policies, and legislative history of the Act . . . ." (Emphasis added). Similarly, in *United States* v. *City of Fulton*, 106 S. Ct. 1422, 1428 (1986), Justice Marshall wrote for a unanimous Court that "[w]e *must* uphold [an agency] interpretation if the statute yields up no *definitive* contrary legislative command and if the agencies' approach is a *reasonable* one." (Emphasis added).

These principles are plainly applicable to the present case. Under Section 9(c) of the Act, "the reclamation . . . developments to be undertaken by the Secretary . . . shall be governed by the Federal Reclamation laws . . . ." There can be no doubt that the Secretary of the Interior is charged with administering this provision, that he has construed the term "reclamation developments" to include the Oahe irrigation storage, and that the governing reclamation laws permit him to market that storage.

There also can be no doubt that Congress nowhere defined the term "reclamation developments" and nowhere addressed "the precise question" whether such developments should include stored irrigation water in the absence of irrigation works. Indeed, it is not surprising that this precise question was never addressed. When Congress approved the Pick-Sloan documents and their plan for Lake Oahe, it plainly contemplated that the stored irrigation water would in fact be used principally *for irrigation*, with municipal or industrial uses arising ancillary to irrigation projects. Consequently, Congress never

squarely addressed the appropriate disposition of the water in the unexpected event that the demand for irrigation and irrigation works at the main stem reservoirs never materialized.

Nevertheless, when the demand did not materialize, the Secretary was required to determine Congress' intent for the stored irrigation water in light of the terms, policies, and history of the Act. As described, he determined that Congress intended (or would have intended had it addressed the question) that the water be disposed of pursuant to the three policies that Congress *did* clearly articulate: (1) that all water in the Basin be put to its maximum beneficial use; (2) that cooperative jurisdiction with the Corps be exercised in order to promote that maximum beneficial use; and (3) that the Pick-Sloan Plan be flexibly applied to meet changing circumstances. Pursuant to those policies and the Secretary's construction of Section 9, he determined that he had authority to put the stored water to its then maximum beneficial use—to advance the development of Western energy resources and at the same time help recompense the Government for the cost of including irrigation storage in the reservoir. This was unquestionably a reasonable interpretation of the statute.

Accordingly, this case is a paradigm for application of *Chevron*. It presented the Secretary with a question "on which 'Congress did not actually have an intent,'" and as to which "'a court may not substitute its own construction . . . for a reasonable interpretation made by'" the Secretary. *Lukhard* v. *Reed*, 55 U.S.L.W. 4561, 4563 n.3 (U.S. Apr. 22, 1987) (quoting *Chevron*, 467 U.S. at 843, 844).[24] Nevertheless, the Eighth Circuit, based on its own "review of the Act and its legislative

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[24] As Justice Blackmun stated in his concurring opinion in *Lukhard*, "[i]n a statutory area as complicated as this one, the administrative authorities are far more able than this Court to determine congressional intent in the light of experience in the field." 55 U.S.L.W. at 4565.

history," was "convince[d]" that the Secretary misperceived his statutory authority. Pet. App. 33a. It therefore rejected the Secretary's construction.

Contrary to the clear command of *Chevron*, however, the Eighth Circuit pointed to no evidence that Congress "ha[d] directly spoken to the precise question at issue," [25] nor to any "definitive . . . command" on that issue.[26] Neither did it consider whether the Secretary's construction of his Section 9 authority was *reasonable* and therefore binding on the courts. Instead, the Court of Appeals simply construed the statute on its own and then held that the Secretary's construction was entitled to no deference because his interpretation of his "statutory mandate" was *incorrect*.

The court justified this inversion of *Chevron* solely on the ground that "[t]he *Chevron* rule requires deference only where an agency reasonably construes the applicable statute *on a matter which is within its jurisdiction to decide*." Pet. App. 33a (emphasis added). Having first determined independently that the Secretary's "assertion of . . . authority" over the Oahe irrigation water was "beyond his statutory mandate," the court reasoned that the Secretary's contrary construction was "*not entitled to judicial deference*." *Id.* 33a-34a (emphasis added). Under that analysis, however, a court would be free to substitute its judgment for the agency's in *every* case where the agency's "jurisdiction" or the scope of its "statutory mandate" could be said to be at issue. There are very few agency decisions which could not be so characterized, as this Court's decisions in *Chevron* and its progeny clearly demonstrate.

For example, *Chevron* itself presented the question whether a permit system established under the Clean Air Act was applicable to certain state industrial plants. That applicability turned on the EPA's construction of

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[25] *Chevron*, 467 U.S. at 842.

[26] *Fulton*, 106 S. Ct. at 1428.

the statutory term "stationary sources," an agency construction which this Court said was owed deference. 467 U.S. at 844-45, 864-66. Yet, under the Eighth Circuit's analysis, the EPA's construction could presumably have been ignored by the courts because it was determinative of the *jurisdictional* reach of the agency's authority.

Similarly, in *United States* v. *Riverside Bayview Homes, Inc.* the question was whether the Corps' jurisdiction over "navigable waters" under the Clean Water Act encompassed certain wetlands adjacent to bodies of water. Citing *Chevron*, this Court held that, where the Corps had determined that it had authority over such wetlands, the judiciary's role was "limited to the question whether it is reasonable . . . for the Corps *to exercise jurisdiction over* [*the*] *wetlands* . . . ." 106 S. Ct. at 461 (emphasis added). This was so even though the Court defined the issue as "a problem of *defining the bounds of* [*the agency's*] *regulatory authority.*" *Id.* at 462 (emphasis added). The Eighth Circuit's interpretation of *Chevron* simply cannot be squared with *Riverside Bayview Homes.*

Finally, in *Commodity Futures Trading Commission* v. *Schor*,[27] this Court expressly rejected the claim that "jurisdictional" issues are exempt from the deference requirement:

> [T]he Court of Appeals was incorrect to state on the facts of this case that the CFTC's expertise was not deserving of deference because of the 'statutory interpretation-jurisdictional' nature of the question at issue. An agency's expertise is superior to that of a court when a dispute centers on whether a particular regulation is 'reasonably necessary to effectuate any of the provisions or to accomplish any of the purposes' of the Act the agency is charged with

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[27] 106 S. Ct. 3245 (1986).

> enforcing; the agency's position, in such circumstances, is therefore due substantial deference.

106 S. Ct. at 3254-55 (citation omitted). The decision below is plainly at odds with this reasoning.[28]

Applying his experience and expertise regarding the application of the Flood Control Act and the reclamation laws to the Missouri Basin reservoirs, the Secretary has determined that disposition of the stored Oahe irrigation water pursuant to the reclamation laws is within his Section 9 authority. His determination is consistent with the history, purposes, and policies of the Act and is eminently reasonable. This Court should therefore defer to that determination.

III. The Remaining Provisions of the Flood Control Act Support the Secretary's Interpretation of the Scope of His Authority Under Section 9.

Ironically, while the Eighth Circuit majority gave little consideration to the provisions, policies, and history of Section 9—or to the Secretary's construction thereof—it paid considerable attention to certain generally applicable provisions of the Flood Control Act. Properly understood, however, these general provisions fully support the Secretary's interpretation of the scope of his authority.

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[28] *See also United States* v. *City of Fulton* (finding the Secretary of Energy's interpretation that he had authority to implement interim power rate increases under Section 5 of the 1944 Flood Control Act "a reasonable accommodation of the policies underlying that Act," 106 S. Ct. at 1430, the Court deferred to that interpretation); *Federal Deposit Ins. Corp.* v. *Philadelphia Gear Corp.*, 106 S. Ct. 1931, 1934 (1986) (reversing the Tenth Circuit's conclusion that certain standby letters of credit fell within FDIC's jurisdiction over "deposits"); *Chemical Mfrs. Ass'n* v. *Natural Resources Defense Council, Inc.*, 470 U.S. 116, 118 (1985) (reversing the Third Circuit's conclusion that EPA Secretary had no statutory authority to grant "fundamentally different factor" variances).

A. Section 8 of the Flood Control Act Confirms that Congress Intended the Reclamation Laws to Govern Irrigation Storage at Corps Reservoirs.

Section 8 of the Act authorizes the Secretary of the Interior "[h]ereafter" "to construct, operate, and maintain under the provisions of the Federal reclamation laws . . . additional works . . . for irrigation purposes" at any Corps-built reservoir upon a finding by the Corps that the reservoir "may be utilized for irrigation purposes" and after authorization by Congress.[29] The Eighth Circuit suggested that if the Secretary had the authority he claimed under Section 9, Section 8 would be superfluous. Pet. App. 26a-31a. This suggestion misconstrues both the language and history of Section 8.

The language of Section 8 quoted by the majority applies to Corps projects *only* where the original Pick-Sloan plans did *not* include a determination that the project could also serve reclamation functions *and* where the Secretary of the Interior proposes to construct "additional works." Neither circumstance exists in this case.

The Pick-Sloan Plan specifically determined that all main stem Missouri Basin reservoirs would be multiple-purpose projects and that Lake Oahe in particular could serve a substantial irrigation function. Nothing in the legislative history of the Flood Control Act remotely suggests that Congress expected the Bureau to repeat the five-year effort that had produced the Sloan Report before exercising jurisdiction over the storage reserved in Lake Oahe for irrigation. Just the contrary is true.

Senator Overton, a principal sponsor of the Act, emphasized in the floor debate that "every one of [the Pick-Sloan] projects has undergone careful scrutiny by the engineers of the Bureau of Reclamation or by the Army engineers." 90 Cong. Rec. 8375 (1944). Likewise in the Senate hearings, all concerned expressed the strong desire to avoid any amendments to the Act that would neces-

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[29] The full text of Section 8 appears at Pet. App. 82a-83a.

sitate reinvestigation of proposed projects that had already been thoroughly analyzed. 1944 Senate Hearings at 548, 692-94. By adopting the Plan, Congress authorized the construction of Lake Oahe with substantial irrigation storage and with a significant portion of its costs allocated to reclamation functions. S. Doc. No. 247, at 3 (App. 98a). All the determinations that Section 8 might otherwise have required had already been made.

The majority's opinion further ignores the first word of Section 8: it applies only to determinations made "hereafter." The Pick-Sloan determinations approved in Section 9 had already been made when Section 8 was adopted. Similarly, Section 8 by its terms applies only to "additional works" constructed to serve reclamation functions.[30] Here, because the Secretary contemplated no new "works," the section simply has no bearing.

Furthermore, contrary to the Eighth Circuit's conclusion, the legislative history of Section 8 demonstrates that the intent underlying Section 8 is entirely consistent with the Secretary's interpretation of Section 9. As the Eighth Circuit noted, the current language of Section 8 reflects a change from its original form.[31]

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[30] One of the principal objectives of Section 8 was to ensure that, before committing federal funds to undertake major water projects, the Secretary of the Interior would be subject to the same requirement of congressional authorization to which the Corps had long been subject. 90 Cong. Rec. 8675 (1944) (remarks of Senator Overton).

[31] Section 8 of the Act originated as Section 6 of the House bill. To avoid confusion, that section will be referred to here as Section 8. As it originally passed in the House, Section 8 would have provided:

> Hereafter, whenever in the opinion of the Secretary of [the Army] and the Chief of Engineers any dam and reservoir project operated under the direction of the Secretary of [the Army] can be consistently used for reclamation of arid lands, *it shall be the duty of the Secretary of the Interior to prescribe regulations for the use of the storage available for such purpose*, and the operation of any such project shall be in

Initially, the section provided that, where storage was available at Corps-operated reservoirs, "it shall be the duty of the Secretary of the Interior to prescribe regulations under existing reclamation law for the use of the storage available for such purpose." Pet. App. 26a n.18. The Eighth Circuit majority conceded that "[t]his language arguably encompassed a broader sphere of authority for the Secretary of the Interior, one more consonant with that for which he argues today." *Id.* 26a. The majority found, however, that the final version of Section 8 diminished the Secretary's authority. This finding misapprehends the reason for the change.

The change was actually proposed by the Secretary himself for technical reasons, 1944 Senate Hearings at 313, and there is not the slightest suggestion in the legislative history that anyone perceived it as a narrower grant of authority to Interior. In his oral testimony, the Secretary explained that his amendment to Section 8 was designed to clarify that reclamation law "in all pertinent respects"—including most particularly the Department's contracting authority—would apply to irrigation storage at Corps reservoirs:

> *The revision of section [8] recommended in my report . . . is purely for purposes of clarification.* That section as it now stands provides for the application of the Federal reclamation laws to the irrigation features of Army reservoir projects. However, *it is not drafted in a way that ties in with the basic provisions of the reclamation laws in all pertinent respects. For example, it speaks of those laws as though they involved merely the imposition of regulations, whereas in truth they are largely designed*

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accordance with such regulations. Such rates, as the Secretary of the Interior may deem reasonable, shall be charged for the use of said stored water; the moneys received to be deposited into the Treasury to the credit of miscellaneous receipts.

H.R. Rep. No. 1309, 78th Cong., 2d Sess. 53 (1944) (emphasis added).

> *to authorize a system of contractual relationships.* It disregards the problem of allocating costs for multiple-purpose facilities serving other uses in addition to irrigation.

1944 Senate Hearings at 458 (emphasis added).

Congress was certainly aware that reclamation law empowers the Secretary of the Interior to contract for non-irrigation uses of water. *See* discussion, *supra*, at 18-19. The foregoing testimony clearly reflects that Secretary Ickes was seeking to preserve, not cut off, that power with respect to the irrigation features of Corps-operated reservoirs. And his amendment was accepted precisely for the reasons he offered in support of it. S. Rep. No. 1030, 78th Cong., 2d Sess. 4 (1944).

The testimony of Colonel Reber likewise demonstrates the Corps' contemporaneous understanding that the amended Section 8 did not restrict the Secretary's authority at Corps-built reservoirs:

> [S]ection [8] as it is written here, *making Federal reclamation laws applicable to the irrigation features of these projects, certainly furnishes the same amount of protection to the irrigation interests as they have in other parts of the country today*, and it seems to me that the adoption of this particular language, putting the Federal reclamation laws into application on the irrigation features of our projects, should go a long way toward settling this controversy.

1944 Senate Hearings at 737 (emphasis added). Moreover, when the conference report reached the Senate floor, Senator Overton emphasized, "[n]o project in this bill which may include *irrigation features* is exempted from the reclamation laws." 90 Cong. Rec. 9264 (1944) (emphasis added). Thus, far from contradicting the Secretary's construction of his authority to invoke the reclamation laws under Section 9(c), the history of Section 8 confirms that those laws were to apply to all irrigation

features contemplated by the Act, not merely irrigation *works*.[32]

Thus, both the language of Section 8 and its legislative history reveal that the Eighth Circuit flatly misinterpreted that provision. Read correctly, the section supports the Secretary's interpretation of the Act.

B. The Legislative History of Section 6 of the Flood Control Act Is Not Contrary to the Secretary's Interpretation.

To sustain its construction of Section 9, the Eighth Circuit majority also pointed to the failure of Congress to adopt a proposal made by Secretary Ickes to amend Section 6 of the Act, 33 U.S.C. § 708 (1982).[33] That Section authorizes the Corps to market "surplus water" for domestic and industrial purposes at the reservoirs it operates. Secretary Ickes proposed adding a proviso that "the Federal reclamation laws shall govern the disposition for domestic or industrial uses of surplus water from any reservoir utilized for irrigation purposes pur-

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[32] The House debate on the original version of Section 8 further confirms that the section gave the Bureau of Reclamation full authority over the storage provided for irrigation in reservoirs built by the Corps. Representative Curtis, for example, stated plainly:

> The thing that we have done in this bill is to state that *in any reservoir where there is storage space available for irrigating farm lands that the regulation of that shall be turned over to the Bureau of Reclamation*, which is a concession on the part of the Army. It is a definite gain on the part of the Bureau, and I believe the Bureau of Reclamation can be trusted to recognize both State rights and the individual rights of the owners of the water.

90 Cong. Rec. 4134 (1944) (emphasis added). He subsequently reemphasized the Secretary's authority, noting: "We have stated in this bill that *control with reference to the available space for irrigation water shall be exercised by the Bureau of Reclamation*. *Id.* (emphasis added).

[33] Section 6 originated as Section 4 of the House bill. For convenience, both sections will be referred to as Section 6. The full text of Section 6 appears at Pet. App. 81a-82a.

suant to Section [6] of this Act." 1944 Senate Hearings at 312-13. In offering the amendment, the Secretary explained:

> While it is true that section [6] does not involve reclamation but covers merely the sale of water for domestic and industrial uses, it is true also that, in those situations where the disposition of water for irrigation purposes will be accomplished under the Federal reclamation laws, the disposition of water for domestic and industrial purposes should be accomplished under the same statutes in order to achieve efficient and economical administration.

Id. at 312.

When the Secretary appeared before the Senate Committee to testify in favor of the amendment, no opposition was expressed. Rather, Senator Overton inquired whether a proposed amendment to the companion rivers and harbors bill "carries out the purpose that you had in mind." *Id.* at 458. Secretary Ickes was not sufficiently familiar with the rivers and harbors bill amendment to respond, but it appears that, thereafter, the Secretary dropped his proposal. It further appears that the amendment Senator Overton referred to was very similar to Secretary Ickes' proposed Section 8 of the final bill.[34]

The most sensible interpretation of this history is that the Secretary withdrew his proposed amendment to Section 6 because the final version of Section 8 adequately accomplished his objectives. By contrast, nothing in this history reflects an intent to *deprive* Interior of all industrial water marketing authority over the irrigation storage in Corps reservoirs.

Indeed, the most this history reflects is an intent to refuse the Secretary *exclusive* industrial water marketing authority. The principal purpose of Section 6 was to give

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[34] *See* 90 Cong. Rec. 8674, 8675 (1944); H.R. Conf. Rep. 2070, 78th Cong., 2d Sess. 7 (1944).

the Corps water marketing authority that it had never had, but that the Bureau of Reclamation had long enjoyed. 90 Cong. Rec. 4125 (1944) (remarks of Representative Whittington). Representative Curtis further emphasized that Section 6 was not intended to address the jurisdiction of the Bureau of Reclamation at all. Responding to an inquiry about the treatment of irrigation waters under the House version of that section, he stated: "there is a specific section dealing with irrigation regulations and that is section [8] which is a later section in the bill. This would indicate to me that section [6] would not be controlling in reference to irrigation waters." *Id.* at 4133. If, in expanding the authority of the Corps Congress intended to limit Interior's authority, that intent nowhere appears.

The sensible reading of Section 6—and the one that causes that section to harmonize with Section 9—is to accord Section 6 the construction indicated by its legislative history: it was intended to give the Corps the authority that Interior already had under Section 9.[35]

C. Section 7's Limited Grant of Authority to the Corps over Storage for Navigation and Flood Control Supports the Secretary's Conclusion that He Has Authority over Irrigation Storage.

Finally, the Eighth Circuit briefly addressed Section 7 to find support for its position. That Section requires the

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[35] It is settled that, if possible, the Court shall read the two Sections to harmonize, not conflict. *E.g., Weinberger* v. *Hynson, Westcott & Dunning, Inc.*, 412 U.S. 609, 631-32 (1973) (quoting *Clark* v. *Uebersee Finanz-Korp.*, 332 U.S. 480, 488 (1947)). It is also settled that if the general provisions of Section 6 were indeed thought to conflict with the specific provisions of Section 9, the latter provision would control. *Fourco Glass Co.* v. *Transmirra Products Corp.*, 353 U.S. 222, 228-29 (1957) (quoting *Ginsberg & Sons, Inc.* v. *Popkin*, 285 U.S. 204, 208 (1932)); *Tanksley* v. *United States*, 321 F.2d 647 (8th Cir. 1963). *See generally* 2A N. Singer, *Sutherland: Statutes & Statutory Construction* § 46.05 (Sands 4th ed. 1984).

Secretary of the Army to "prescribe regulations for the use of storage allocated for flood control or navigation." [36] The Eighth Circuit concluded that Congress' failure to correspondingly authorize the Secretary of the Interior to regulate irrigation storage meant by implication that the Secretary did not have that authority. As Judge Bright noted, however, the more logical implication is that Congress did not add a parallel provision because it believed the Secretary already possessed the requisite power through Section 9 of the Act and 9(c) of the Reclamation Act. The two Secretaries thus have comparable authority, and all of the storage in Basin reservoirs falls under the jurisdiction of either Interior or the Army.

By contrast, under the majority's reading, Section 7 would contradict Section 9's intention to afford each agency functional authority in its area of expertise. Indeed, under the majority's view, excess irrigation storage would fall outside the jurisdiction of *any* agency and could not be disposed of *at all*. There is no implication anywhere in the Act that Congress intended such an absurd result.

Therefore, to the extent the other provisions of the Flood Control Act are pertinent to the Secretary's Section 9 authority, those provisions confirm his authority.

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[36] The full text of Section 7 appears at Pet. App. 82a.

CONCLUSION

For the foregoing reasons, the judgment of the court of appeals should be reversed.

Respectfully submitted,

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APPENDICES

APPENDIX A

78th Congress, 2d Session . . . . House Document No. 475

MISSOURI RIVER BASIN

LETTER

FROM

THE SECRETARY OF WAR

TRANSMITTING

A Letter From the Chief of Engineers, United States Army, Dated December 31, 1943, Submitting A Report, Together With Accompanying Papers and Illustrations, on a Review of Reports on the Missouri River, for Flood Control Along the Main Stem From Sioux City, Iowa, to the Mouth, Requested by a Resolution of the Committee on Flood Control, House of Representatives, Adopted on May 13, 1943

[LOGO]

MARCH 2, 1944.—Referred to the Committee on Flood Control and ordered to be printed with two illustrations

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United States

Government Printing Office

Washington: 1944

LETTER OF TRANSMITTAL

WAR DEPARTMENT,
Washington, February 28, 1944.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

DEAR MR. SPEAKER: I am transmitting herewith a report dated December 31, 1943, from the Chief of Engineers, United States Army, together with accompanying papers and an illustration, on a review of reports on the Missouri River, with a view to flood control along the main stem from Sioux City, Iowa, to its mouth, requested by a resolution of the Committee on Flood Control, House of Representatives, adopted on May 13, 1943.

In view, however, of the large quantities of materials, equipment, and manpower which would be required on the construction of the projects proposed in the report, and since there is no presently indicated necessity for them in the war program, the Department considers that initiation of construction should be deferred until after the war or until essentiality in the war effort has been established.

By letter of February 16, 1944, the Bureau of the Budget advises that there would be no objection to the submission of the report to Congress for its information, but that the authorization of the improvements recommended by the Chief of Engineers would not be in accord with the program of the President, at least at the present. Further advice as to the relationship to the program of the President, of the improvements considered in the report, will be given by the Bureau of the Budget after review and consideration by that Bureau of reports of other Federal agencies and additional material to be submitted by the Chief of Engineers. A copy of the letter of the Bureau of the Budget containing its comments is enclosed.

Respectfully,

HENRY L. STIMSON,
Secretary of War.

LETTER OF THE CHIEF OF ENGINEERS, UNITED STATES ARMY

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, December 31, 1943.

The CHAIRMAN, COMMITTEE OF FLOOD CONTROL,
House of Representatives, Washington, D. C.

MY DEAR MR. CHAIRMAN: 1. The Committee on Flood Control of the House of Representatives, by resolution adopted on May 13, 1943, requested the Board of Engineers for Rivers and Harbors to review the reports on the Missouri River contained in House Document No. 238, Seventy-third Congress, second session, and House Document No. 821, Seventy-sixth Congress, third session, with a view to determining whether any modification should be made therein at this time with respect to flood control along the main stem of the Missouri River from Sioux City, Iowa, to its mouth. I enclose the report of the Board in response thereto.

2. The Board concurs in the report of the division engineer and recommends modification of the approved general comprehensive plan for flood control and other purposes in the Missouri River Basin to include 12 additional multiple-purpose reservoirs, works to divert water to the Devils Lake and James River Basin regions, and a system of levees and appurtenant works along the Missouri River between Sioux City and the mouth, in general accordance with the plan of the division engineer, as shown on the accompanying map, with such modifications thereof and changes therein as the Secretary of War and Chief of Engineers may find advisable, at an estimated cost to the United States of $481,600,000 for these additional works, with local cooperation as specified in the Board's report. The Board further recommends that in

addition to previous authorizations of funds there be authorized, for appropriation, funds sufficient to provide for initiation and prosecution of the expanded general comprehensive plan in logical steps.

3. The reports of the division engineer and the Board were referred to the Bureau of Reclamation, the Federal Power Commission, and the Department of Agriculture for their comments. Several conferences have also been held both in Washington and in the field between representatives of these agencies and of the Corps of Engineers. The views and comments of the three agencies are contained in full in the letters of reply which accompany this report.

4. The Department of Agriculture states that, although its responsibilities do not embrace the construction of the types of engineering works discussed in the report, the benefits of the proposed program for flood control, irrigation, power, navigation, wildlife, recreation, and other multiple-purpose developments are of great concern to the interests of agriculture in this important area and will have a direct bearing on the use of the rural resources of the basin. Both the droughts of recent years and the disastrous floods of 1943 demonstrate the need for such a comprehensive plan of multiple-purpose regulation and development of the upper Missouri River. The Department of Agriculture is of the opinion that the proposal of the division engineer and of the Board of progressive step-by-step cooperative development is a constructive approach to the solution of the problems of water use in the Missouri River Basin and it assures its full cooperation in the accomplishment of this plan. That Department believes that it may be of particular assistance through its programs for water-flow retardation and soil-erosion prevention which may serve as valuable supplements to the comprehensive program.

5. The Federal Power Commission is of the opinion that the proposed comprehensive plan should go far to-

ward resolving present conflicts of interest in the use of the water resources of the basin through the construction of additional storage reservoirs. These conflicts now arise because of insufficiency of usable water, under present conditions of basin development, to meet all projected water requirements. The Commission approves the recognition in the report of the importance of cooperation among governmental agencies and local interests in the development of the program and it desires to cooperate further in the working out of details. It considers that the Missouri Basin affords a unique opportunity for such cooperative procedure, which should be directed to assure the maximum benefits possible under the multiple-use concept. The Commission is convinced that power development will prove an important factor in the Missouri Basin program and believes that at least 10,000,000,000 kilowatt-hours of additional hydroelectric energy per year may eventually be developed without sacrifice of other benefits to the region from the use of its water resources. The Commission recommends that current authorizations for flood control be broadened to permit construction for multiple-purpose use and that the plan of the division engineer and the Board for undertaking the development of the Missouri River on a step-by-step basis be authorized, with latitude for such modification as changing conditions show to be desirable.

6. The Bureau of Reclamation believes that the development of a truly comprehensive plan of improvement for the Missouri River Basin can best be accomplished through integration of the studies and investigations of the Corps of Engineers with those of the Bureau, each agency operating in its respective field as determined by existing law. A proportionate share of all the benefits from an integrated basin program should, in the opinion of the Bureau, be applied to each feature of the program in advance of construction, and all reservoirs, including Fort Peck, should be operated to obtain the maximum benefit from all water uses, with preference being given

to functions which contribute most to the welfare and livelihood of the greatest number of people. The Bureau recommends adoption of the policy that works of improvement under a comprehensive plan should be constructed, maintained, and operated by the agency with the dominant interest under existing law, after appropriate consultation with other agencies definitely concerned with phases other than that interest. The Bureau considers the plan of improvement proposed in the reports of the division engineer and the Board of Engineers for Rivers and Harbors, adequate for flood control along the lower river, but calls attention to flood problems on the upper tributaries for which a solution is not provided. It is the opinion of the Bureau that reservoirs on the Yellowstone River and tributaries should be built primarily for irrigation after coordination with plans now being prepared by the Bureau, and that the door should be left open for possible changes in the number and size of the proposed main-stem reservoirs and in plans for diversions into the Dakotas. If the improvements proposed by the division engineer and the Board are carried out in accordance with the views of the Bureau of Reclamation, that agency sees no reason why these improvements would not fit in a comprehensive plan for the Missouri River Basin.

7. It is evident that all the Federal agencies concerned agree that the maximum feasible multiple-purpose use of water and the broadest economic program of reservoirs for that type of use are the primary principles on which the planned development of the water resources of the Missouri River Valley should be based. It is equally evident that to accomplish this type of development, the details of planning must be worked out in a progressive manner through the correlation and coordinated efforts of all agencies, Federal, State, and local, concerned with these resources. Due allowance must be made for any changed conditions that may arise in the future. However, I do not consider it practicable to make final allocation of proportionate costs in advance of construction.

8. The appropriate distribution of proper benefits over the entire valley is a definite part of the plan proposed in the report of the division engineer and the Board, not only to those projects recommended in the report itself, but also to any others that may legally be proposed by other agencies. That report also contemplates that the uses of presently authorized and existing multiple-purpose reservoirs will be progressively broadened and reapportioned as additional water is stored by the dams proposed in the expanded plan. The adjustment of water use to meet the changing needs of the Missouri Basin as a whole can and will be made as the comprehensive development proceeds step-by-step toward ultimate accomplishment. When completed the basin plan will be operated for maximum multiple-purpose use. Thus preference can be given to the functions which contribute most significantly to the welfare and livelihood of the people of various parts of the basin, and at the same time adequate steps can be taken to meet new economic situations that may arise in the future.

9. The Corps of Engineers recognizes the broad and important interests and responsibilities of the Bureau of Reclamation in the Missouri River Basin and will continue to plan its work in that basin so as to coordinate fully the activities of both agencies. There is no question that reservoirs on the Yellowstone River and its tributaries will furnish an important contribution to water conservation in the upper portion of the Missouri Valley. The two reservoirs proposed in the report of the division engineer and of the Board, augmented by such additional projects as the Bureau may find advisable, should be planned, with modifications if necessary, to provide the maximum feasible storage for conservation purposes. Many of the reservoirs of the proposed system will produce major benefits to conservation and irrigation, notably in the upper basin. Tributary reservoirs should, when advisable from the standpoint of basin-wide development,

be constructed, operated, and maintained by the agency with the dominant interest under existing law. It is essential, however, that the main-stem projects be built, operated, and maintained by the Corps of Engineers, and that the utilization of storage reserved for flood control in all multiple-purpose reservoirs on tributaries be in accordance with regulations prescribed by the Secretary of War, in order to secure necessary unified control of the flood waters of the Missouri River itself, and to coordinate reservoir operation in this basin with that of other basins to obtain the maximum practical results for flood control on the Mississippi River. Conversely, utilization of storage reserved for irrigation in all multiple-purpose reservoirs should be in accordance with regulations prescribed by the Secretary of the Interior.

10. The amount of storage in the main-stem reservoirs and the location and size of these reservoirs is of vital importance to the ultimate development of the entire basin. I am convinced in the light of all information now available that the plan of the division engineer and the Board provides a flexible basis for securing that storage and obtaining the full multiple-purpose use of the waters of the Missouri Valley. The plan contemplates further expansion with a view to solving the flood and other problems in the upper tributary basins. Many of these solutions will doubtless be accomplished through the construction, by appropriate agencies, of additional multiple-purpose reservoirs on those tributaries and headwater streams.

11. The Department recognizes water-flow retardation, soil-erosion prevention, and production of hydroelectric power as important parts of the Missouri Basin program. The generation of power, in multiple-purpose projects now authorized for flood control and in those proposed in the expanded plan of development, is a definite part of the recommended program. Plans for the production, transmission, and sale of hydroelectric power should be

worked out with the cooperation of the Federal Power Commission. Installation of power facilities so as to meet the economic needs of the Missouri Basin should be approved from time to time by the Secretary of War upon recommendations by the Federal Power Commission and the Chief of Engineers.

12. The proposed reservoirs will inundate Indian lands at several points. The estimates submitted on the over-all cost of the projects include funds to cover the cost of taking such lands and buildings, including relocation of burial grounds. It is to be understood, therefore, that approval of this plan includes authority for the Indians through their tribal councils, with the approval of the Secretary of the Interior, to convey and relinquish such property to the United States, and authority for the Secretary of War to enter into appropriate agreements with the Secretary of the Interior and the Indian tribes concerned for the payment of the fair value of the property taken, or for the contribution of a sum approximating such value toward locating or constructing or toward relocating or reconstructing buildings, works, facilities, or water projects in the vicinity of the Missouri River or its tributaries.

13. In summary, I believe that the expanded plan of development for the Missouri River Basin as recommended by the division engineer and the Board, establishes a broad framework for comprehensive basin-wide improvements that will derive the maximum benefits from the full multiple-purpose use of the water resources of that basin. That plan is flexible in that it proposes sufficient latitude to permit such modifications thereof and changes therein as may be found advisable, and it should be augmented by appropriate work of other agencies duly constituted by law to perform such work. Thus there are no problems of water use that cannot be satisfactorily solved with the full cooperation of all water-use agencies as the over-all plan of improvement is placed under construction.

14. This comprehensive plan should be approved now and at least the first phase of development authorized to be prosecuted in the same manner as that prescribed by existing law for similar comprehensive plans for large river basins. Approval at this time will permit details to be worked out through coordination and cooperation with all other agencies concerned and will enable working plans to be prepared so that construction can be initiated expeditiously and prosecuted with efficiency and dispatch throughout the post-war period.

15. I have considered carefully the reports of the division engineer and the Board of Engineers and the statements thereon made by the three afore-mentioned Federal agencies. I concur with the Board of Engineers in approving the plans of the division engineer and I recommend modification of the general comprehensive plan for the Missouri River Basin substantially in accordance with the plans of the division engineer for flood control, irrigation, power development, navigation, and other purposes, with such modifications thereof and changes therein as the Secretary of War and Chief of Engineers may from time to time find advisable, at an estimated cost to the United States of $481,600,000 for additional works; subject to the conditions that local interests provide without cost to the United States all land, easements, and rights-of-way necessary for construction of levee units and appurtenant works and maintain the levee units and appurtenant works after completion; maintenance includes normally such matters as cutting grass, removal of weeds, local drainage, and minor repairs. It is further recommended that in addition to previous authorizations of funds there be authorized for appropriation, funds sufficient to provide for initiation and prosecution of the expanded general comprehensive plan in logical steps.

Very truly yours,

E. REYBOLD,
Major General, Chief of Engineers.

COMMENTS OF THE BUREAU OF RECLAMATION

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, D.C., December 17, 1943.

Maj. Gen. E. REYBOLD,
Chief of Engineers, War Department.

DEAR GENERAL REYBOLD: It have studied carefully the report of the Board of Engineers for Rivers and Harbors, dated August 23, 1943, on the subject of the Missouri River, mouth to Sioux City, Iowa, upon which, in your letter of August 28, 1943, you requested the Bureau of Reclamation to make comments.

A PLAN FOR THE WHOLE BASIN

Primarily, the Bureau of Reclamation desires to emphasize that the plan for the Missouri Basin initially presented to the Congress should be truly comprehensive in adequately providing not only for the control of floods and the improvement of navigation, but also for full development of irrigation, hydroelectric power production, and all other beneficial uses of water. The criterion for the design of the plan, and of its component parts, should be whether it will secure that management of the waters of the Missouri River which is most beneficial to the residents of the basin.

The report of the Board of Rivers and Harbors, in accordance with the general congressional authorization to the Corps of Engineers, is directed principally toward flood control and navigation improvement. A report on the Missouri River Basin, based on over 5 years of intensive investigations, is currently being prepared by the Bureau of Reclamation for completion this spring. That report, likewise in accordance with the general congressional authorization to the Bureau of Reclamation, is directed primarily toward the development of irrigation,

hydroelectric power production, and other beneficial uses of water. I believe that you will agree that a truly comprehensive plan can be developed best through integration of these two approaches.

GOVERNING PRINCIPLES

The development of such a comprehensive plan involves adjustment of many factors of flood control, navigation, irrigation, hydroelectric power production, and numerous other functions of water conservation and management. These adjustments in a unified program can be accomplished satisfactorily only if certain principles are recognized as fundamental in the control and utilization of the waters of the Missouri River. Likewise certain principles of administration are indicated to assure effective, coordinated, and economical planning and execution of the program. I am taking this occasion to express the views of the Bureau of Reclamation on these matters, since they are the basis of my specific comments on the plan that you have presented. I also recommend that these principles be incorporated into whatever authorizing legislation may be enacted by the Congress. If these principles govern, and if the specific comments I make later in this letter are satisfied, then there remains no reason why the work proposed by the report of the Board of Rivers and Harbors, as thus modified, would not fit the comprehensive plan for the basin. There would then be no necessity for delaying the first phase of construction for further integration with later reports. Projects of the Bureau of Reclamation, as authorized by Congress, likewise would be integral with the comprehensive plan. The principles are enunciated below:

1. It is recognized that a sound program for the river subbasins of the Missouri comprehends a wide variety of functions, including but not limited to flood control, navigation, irrigation, restoration of surface and ground water levels, hydroelectric pro-

duction, pollution abatement, fish and wildlife preservation and recreation. In many, if not all, portions of the entire Missouri watershed some, many, or all of these functions are closely interrelated. In practice, programs for the component subbasins will be developed in several stages each of which should include provision for suitable features necessary for the interrelated functions such as flood control, navigation, irrigation, power production, etc., that are then present.

2. In conformity, with that principle, justification procedure should provide for applying the sum of all of the benefits deriving from such an integrated basis program to all of the features included in it. The final allocation of proportionate costs among the various multiple benefits that will accrue from any one feature or group of features should, therefore, be made jointly and reported to the Congress in concert by the Corps of Engineers, the Bureau of Reclamations, and the Federal Power Commission. These allocations should be reported in advance of the start of construction of any group of related features.

3. In planning the control and utilization of the waters of the Missouri Basin, the widest range of multiple benefits should be sought in each feature or group of features. All reservoirs included in the comprehensive plan, including Fort Peck, should be operated to obtain the maximum benefits in common for flood control, navigation, irrigation, power generation, and other water-conservation activities, including, but not limited to, utilization for fish and wildlife preservation, recreation, pollution abatement, maintenance of surface and ground water levels, silt control, and domestic and industrial purposes. To the extent, however, that several functions

of water control and utilization are conflicting, preference should be given to functions which contribute most significantly to the welfare and livelihood of the largest number of people. It is, for example, the view of the Bureau of Reclamation, that the waters of the Missouri River and its tributaries west of or entering above Sioux City are more useful to more people if utilized for domestic, agricultural, and industrial purposes than for navigation-improvement purposes. To the extent that these uses are competitive, domestic, agricultural, and industrial uses should have preference.

4. The Corps of Engineers should construct, operate, and maintain any feature in which flood control and navigation are dominant considerations, and the Bureau of Reclamation should construct, operate, and maintain any feature in which the functions of irrigation, restoration of surface and ground water levels, and power are dominant. To the extent that irrigation, restoration of surface and ground water levels and power are involved in the construction, operation, and maintenance of features in which flood control and navigation are dominant, the Corps of Engineers would advise and consult with the Bureau of Reclamation in the construction, operation, and maintenance of such features; and to the extent that flood control and navigation are involved in features in which irrigation, restoration of surface and ground water levels, and power are dominant, the Bureau of Reclamation would consult and advise with the Corps of Engineers in the construction, operation, and maintenance of such features.

5. The main-stem reservoirs below Fort Peck dam as described in the report of the Board of Rivers and Harbors and as finally authorized, because of their peculiarly close relationship with flood control and navigation below Sioux City, should be constructed,

operated, and maintained by the Corps of Engineers. The corps should, however, consult with the Bureau of Reclamation in advance of designing or constructing the necessary dams in order that the plan, purposefully rendered flexible in the report of the Board of Rivers and Harbors, will be adjusted to the needs of irrigation and power as they are developed by the Bureau of Reclamation in North Dakota and South Dakota and, if and when appropriate, other States of the arid and semiarid zone.

RECLAMATION'S INTEREST

For the purpose of indicating the extent of the interests of the Bureau of Reclamation in the Missouri River Basin, you may find illuminating data developed by our studies. At the present time there are 4,185,000 acres of land irrigated in the entire basin, of which 555,000 are in Federal projects. The irrigation works serving this land represent investments totaling approximately $200,000,000 of which $61,753,000 are in Federal projects. At present there are 1,342 water-storage reservoirs in the basin, including 11 that principally serve for power generation. Exclusive of the Fort Peck reservoir, which has a capacity of 19,412,000 acre-feet, these reservoirs have a combined capacity of 8,116,000 acre-feet of water. At present there are hydroelectric plants in the basin of a total installed capacity of 461,383 kilowatts, of which about 100,000 kilowatts are in Federal power plants.

Our studies indicate that an additional 4,400,000 acres of land in the basin can be irrigated, 2,300,000 acres from the main stream and the remainder from its tributaries, through the construction of some 90 additional reservoirs and related irrigation works. These studies indicate also that an additional 952,000 kilowatts of hydroelectric power can be developed through utilizing head created at some of the new reservoirs.

In 1940, the value of all crops produced in the 7 arid and semiarid States of the basin was $444,192,000. Our studies indicate that through full irrigation development of the basin additional crops with a value of $100,500,000 per annum can be produced. The significance of this to the 4,699,781 people who live in the States that are arid and semiarid, at least in part, in the Missouri River Basin, is not found entirely in the fact that the annual increase would be nearly equal to one-fourth of their entire agricultural income in 1940. The increase in stability that would be provided would be the major consideration. The effects of droughts, which in the past decade caused a net loss of 302,314 in the population of the basin, would be materially ameliorated when such droughts reoccur, as they will in the future. Our estimates are that more than 350,000 persons would find stable farm homes on the newly irrigated land alone. It is obviously important, when these facts are considered, that the irrigation possibilities be realized.

Much of the water that will be used in some parts of the basin in the irrigation of lands must be lifted by pumps to the canals. The hydroelectric power that is possible of development must be closely integrated in the irrigation plan or many possibilities never can be realized. The potential power, of course, will open important commercial and industrial avenues that will lead the whole area to new developments, which, in their degree, also will contribute to new prosperity and added stability.

Directly associated, also, with the irrigation development will be the restoration of surface and ground-water levels through diversion of water from the main stream and spreading it through canals. The problem of restoring Devils Lake will thus be met, and ways will be opened to attack the problem of restoration of the ground water in the North Dakota sandstone strata that is the source of supply of most of the domestic wells in several States. Diverted water will assist also in ameliorating pollution

problems at nearly a score of cities in North Dakota, South Dakota, and Minnesota.

The Bureau of Reclamation has developed an inventory of irrigation projects that is more nearly complete than exhibit C of your report of September 30, 1933, House Document No. 238, Seventy-third Congress, second session. For the information of the corps and those who may be interested in the plans for the Missouri Basin that we are developing, I am attaching our map of proposed Missouri River Basin developments. This map is not complete as to irrigation projects of less than 1,000 acres in area. The reservoirs shown to be under consideration by this map, in a number of instances, will be useful for the production of power in addition to irrigation, and in many instances they will have appreciable, if not major, flood-control contributions to make.

SPECIFIC COMMENTS

In the light of the discussion that has preceded, I offer the following comment on the report of the Board of Rivers and Harbors that you have submitted:

A. The authorized and proposed reservoirs would provide adequate flood control, I agree, on the Republican, Kansas, Osage, and Gasconade Rivers and on Cherry Creek through the city of Denver. Construction of the separate projects in these basins should be undertaken by the agency which has the dominant interest, as determined by the policy suggested in subparagraph numbered 4 of this letter.

B. The Boysen and Lower Canyon reservoirs that are proposed, on the other hand, I believe will not provide relief from the damaging ice-jam floods along the Yellowstone River. Since they control too little run-off to be very effective in reducing flood peaks below Sioux City, I question that their construction should be authorized with that purpose only in mind. They should not be authorized for construction and subsequent use for flood-control and navigation pur-

poses below Sioux City in advance of a coordinated study and report on the Yellowstone and its tributaries in which this Bureau participates. The interests of irrigation in Wyoming and Montana are likely to be intimately affected by these two reservoirs, which should be constructed, if and when authorized, by the Bureau of Reclamation.

C. If the plan as now authorized were to be modified as proposed by the report of the Board of Rivers and Harbors and completed, there would remain throughout the upper part of the basin, at least, flood-damaged and flood-menaced areas for which no relief would have been authorized.

D. I am in hearty agreement with the proposal that modification of the plans for the reservoirs proposed in the report of the Board of Rivers and Harbors be an expressly reserved privilege. Our studies indicate that the corps may want to adjust its plans for the location and size of some of these reservoirs when the full facts are developed. The Bureau of Reclamation contemplates the recommendation of construction of a number of reservoirs upstream from the main-stem reservoirs that have been included in the report of the Board of Rivers and Harbors. Numbers of these will have flood-control functions, and they may have far-reaching effects on the storage capacity needed on the Missouri River in North Dakota and South Dakota. Full consideration of these matters may considerably alter the reservoirs as initially suggested. For example, through elimination of one of the main-stem reservoirs, if that should be found to be warranted, and the substitution of several reservoirs on tributaries to provide commensurate flood-control storage, it probably would be possible for the Bureau of Reclamation to make marked irrigation contributions that are not contemplated in the report as it was submitted for comment. Also, our studies indicate that diversions of water from the Fort Peck

Reservoirs and the Oahe site for use in North Dakota and South Dakota may be preferable to the proposal in the report that a diversion be made at Garrison Dam. Precisely the same ends would be served, many of them perhaps in higher degree and more profitably for everyone. I should not like to see the door closed now against consideration of any alternate means of replenishing Devils Lake, diverting water into the James and Sheyenne Rivers, and providing for irrigation east of the Missouri River.

Thank you for providing me this opportunity to review the report and to make comments upon it. I hope these views may assist in the completion of the best plan that it is possible now to devise, and in the integration of our work into a truly comprehensive plan for the Missouri River Basin as a whole.

Sincerely yours,

H. W. BASHORE, *Commissioner.*

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, August 28, 1943.

Mr. H. W. BASHORE,
Commissioner, Bureau of Reclamation,
Washington, D. C.

DEAR MR. BASHORE: In accordance with our agreement with reference to multiple-purpose projects, I am enclosing herewith a folder containing copies of the reports of the division engineer and of the Board of Engineers for Rivers and Harbors on the Department's authorized survey on Missouri River, Sioux City, Iowa, to the mouth, with the request that you furnish me with your comment thereon as soon as practicable.

Very truly yours,

E. REYBOLD,
Major General, Chief of Engineers.

* * *

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

WAR DEPARTMENT,
THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
Washington, August 23, 1943.

Subject: Missouri River, mouth to Sioux City, Iowa.

To: The Chief of Engineers, United States Army.

1. This report is in response to the following resolution adopted May 13, 1943:

> *Resolved, by the Committee on Flood Control, House of Representatives*, That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act approved June 13, 1902, be, and is hereby, requested to review the report on the Missouri River contained in House Document No. 238. Seventy-third Congress, second session, and House Document No. 821, Seventy-sixth Congress, third session, with a view to determining whether any modification should be made therein at this time with respect to flood control along the main stem of the Missouri River from Sioux City, Iowa, to its mouth.

2. The Missouri River has its source in southwestern Montana, flows generally east and south for 2,460 miles through or along seven States, and empties into the Mississippi River 17 miles above St. Louis, Mo. It drains 529,350 square miles consisting largely of plains but including also easterly slopes of the Rocky Mountains and other rugged areas. About 60 percent of the watershed is upstream from Sioux City, Iowa, 760 miles above the river mouth. The principal tributaries below Sioux City are the Platte and Kansas Rivers from the west and the Grand, Osage, and Gasconade Rivers in Missouri. The average annual precipitation ranges from 26 inches at

Sioux City to 40 inches at the river mouth. The soils are very fertile and agriculture is the predominant land use. Sioux City, the Kansas Citys, at mile 377, and the intervening cities of Omaha, Nebr., and Council Bluffs, Iowa, on opposite sides of the Missouri River at mile 632, contain many major industries and important railroad facilities. During drought periods the regions in the vicinity of Devils Lake and James River in the Dakotas become so short of water that the entire population both human and animal is subject to great hardships. The problem of a possible diversion of water from the upper Missouri River to those areas has been under consideration for a long period.

3. Congress has authorized improvement of the Missouri River for navigation to secure a minimum low water depth of 6 feet between the mouth and Sioux City by means of bank revetment, construction of permeable dikes to contract the low water channel and stabilize the waterway, and by dredging. Although this work has not been completed, commercial use is made of the river and the construction accomplished has removed the threat of bank erosion and the occurrence of cut-offs which were formerly very destructive of bordering properties and crops. Primarily to improve the low water flows for navigation, the United States has constructed Fort Peck Reservoir, with storage capacity of 19,500,000 acre-feet, on the Missouri River in Montana. Recently a power plant with 35,000 kilowatt capacity to generate power for irrigation pumpage and other purposes has been placed in operation at Fort Peck Dam. By storing flood waters this reservoir also produces large flood-control benefits.

4. Two types of severe general floods, known as March and June floods from the months in which they usually occur, are characteristic of the Missouri River. The March floods result from melting snow in the plains area above Sioux City and the break-up of river ice. These floods are usually accompanied by only a small amount of

precipitation. June floods result from snow thaws in the headwater mountains accompanied by heavier rainfall. In addition flash floods of local origin cause heavy damages nearly every year. Severe floods between Sioux City and the mouth occurred in 1844, 1881, 1903, 1908, 1909, 1915, 1927, 1935, 1942, and 1943. Flood flows from the Missouri River contribute substantially to flood stages and damages along the Mississippi River. Between Sioux City and the mouth of the Missouri about 1,800,000 acres of land, largely cultivated and highly productive, are subject to inundation at extreme river states. Important areas in Sioux City, Omaha, Council Bluffs, and the Kansas Citys, and parts or all of over 50 smaller municipalities, are included in the flood plain. In March, May, and June of 1943 very severe floods occurred which overtopped or caused failure of nearly all the levees on the Missouri River below Sioux City. The division engineer estimates the damages of these three floods along the main stem below Sioux City at $35,000,000. Under general provisions of the Flood Control Act of 1941 and the act for emergency flood control work approved July 12, 1943, the Department spent $800,000 for rescue and emergency work and is now assisting local interests in restoring their levees to afford the original degree of protection which is estimated to cost $1,800,000.

5. Improvements constructed by local interests to secure relief from floods along the Missouri River between Sioux City and the mouth consist of levees and drainage works at many localities. These improvements, which are reported to have cost $20,000,000, generally afford only minor protection to the areas included. By the Flood Control Act approved June 22, 1936, Congress authorized the construction of levees and walls to afford protection from floods at the Kansas Citys in accordance with plans approved by the Chief of Engineers on recommendation of the Board of Engineers for Rivers and Harbors and as amended by further surveys and studies. This work has been partially completed. In a survey report of June 27,

1942, submitted to the Chief of Engineers, the division engineer recommends modification of the plan to include a cut-off near the Kansas Citys and various changes in the protective works. He estimates the total cost of the works under his modified plan at $15,200,000. The Flood Control Act of August 18, 1941, authorized bank erosion prevention works in the vicinity of Sioux City and levees for protection between Sioux City and Kansas City and authorized $1,000,000 for initiation of construction. These levees would afford protection from a flood similar to that of 1938. No construction has yet been undertaken. By the Flood Control Act of June 28, 1938, Congress approved a general comprehensive plan for flood control and other purposes in the Missouri River Basin and, for its initiation and partial accomplishment, authorized $9,000,000 for reservoirs to be selected and approved by the Chief of Engineers. The Flood Control Act of August 18, 1941, authorized the appropriation of $7,000,000 additional for prosecution of the plan, including the Harlan County Reservoir on Republican River and such other supplemental flood control works on the Republican River as the Secretary of War and Chief of Engineers may find advisable. Construction of reservoirs under this plan has not been commenced except for Kanapolis Reservoir in the Kansas River Basin. Work on this partially completed reservoir has been deferred to conserve critical materials and labor during the war. A plan for reservoir storage of flood waters on Cherry Creek, Colo., an extreme headwater of Platte River, now estimated to cost $11,000,000, was also approved by the Flood Control Act of 1941 and $3,000,000 authorized for partial accomplishment. The estimated total cost of the reservoirs and the protection works for the Kansas Citys is $171,000,000.

6. Local interests desire the undertaking of such works as may be found appropriate for securing relief from floods for the farm lands, cities, and smaller urban communities along the Missouri River between Sioux City and the mouth. In view of the magnitude of the problem

and the number of separate interests involved, they believe that this should be accomplished as a Federal project. Had the levees authorized by the act of 1941 for the section between Sioux City and Kansas City been constructed, they would not have afforded protection during the flood period of the current year. In view thereof, local interests urge a reconsideration of flood protection measures for the entire 760 miles of river and the formulation and execution of a coordinated comprehensive plan of adequate works.

7. The division engineer finds that a proper solution of the flood problems along the main stem of the Missouri River requires the formulation of a comprehensive plan for works to supplement those heretofore approved. He presents such a plan which provides for the construction of 12 additional multiple-purpose reservoirs, 5 on the Missouri River with dams located above Sioux City between Yankton, S. Dak., and Garrison, N. Dak., 2 in the Yellowstone River Basin, and 5 on tributaries of the Republican River; such works as required to convey a feasible amount of water from the proposed Garrison Reservoir on the upper Missouri River across the Divide to the Devils Lake area and to the headwaters of James River; and levees along both banks of the Missouri River between Sioux City and the mouth to protect all areas practicable, with flood walls as necessary in congested areas including pumping plants and drainage outlets. With the reservoirs the levees are planned to afford protection against floods equal to the largest of record. The division engineer estimates the Federal cost at $410,000,000 for reservoirs and related works and $71,600,000 for levees and their appurtenances; and the cost to local interests at $8,400,000 for levee rights-of-way and relocations; making a total cost of $490,000,000. By these proposed improvements, not only would large flood damages be prevented along the Missouri River and its tributaries and the Mississippi River, but also floodwaters would be retained for their best uses for all purposes including

irrigation, navigation, power, domestic and sanitary purposes, wildlife, and recreation. Considering the large benefits of tangible nature and such intangibles as the saving of human lives, the alleviation of suffering, stabilization of the economic life of the valley, and encouragement of industrial and civic developments, the division engineer concludes that the plan is thoroughly justified. He proposes it as a progressive improvement to be undertaken by steps as conditions warrant and the availability of funds permits.

8. The division engineer recommends: (*a*) That the general comprehensive plan for flood control and other purposes in the Missouri River Basin approved by the act of June 28, 1938, as modified by subsequent acts, be expanded to include the plans presented herein and as expanded be approved for prosecution by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers with such modifications thereof and changes therein as in the discretion of the Secretary of War and the Chief of Engineers may become advisable; (*b*) that all reservoirs constructed under the approved plan shall be constructed, operated, and maintained by the War Department under the direction of the Secretary of War and the supervision of the Chief of Engineers; (*c*) that no money appropriated for the prosecution of the works herein recommended shall be expended on the construction of any levee until States, levee districts, or local interests have furnished without cost to the United States all lands, easements, and rights-of-way for levees and have agreed that they will maintain the levees after their completion; (*d*) that in addition to previous authorization for the Missouri River Basin there be authorized to be appropriated a sum adequate to provide for the initiation and prosecution of the expanded general comprehensive plan in a logical step-by-step manner.

VIEWS AND RECOMMENDATIONS OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS

9. Flood control and the conservation of water resources are urgently needed in the Missouri River Basin. The water that now produces floods should be stored and put to beneficial use in the interest of navigation, power development, irrigation, and other useful purposes. To accomplish this, the division engineer has presented a comprehensive plan for improvement which in the opinion of the Board is sound and adequate. Such an extensive program would necessarily be carried out step by step with the details formulated progressively in cooperation with other Federal agencies and local interests so as to take into account future trends in precipitation and agricultural and industrial developments.

10. The division engineer has largely confined his discussion of benefits of the plan to the Missouri River Basin, which embraces approximately one-sixth of the total area of the United States. During the current year, floods along the main stem of the Missouri River caused an estimated damage of $35,000,000 for the section below Sioux City alone, or an amount nearly one-half as large as the estimated cost of the proposed levees. Considerably higher stages have been experienced in the past whose recurrence under present conditions would cause damages many times greater than those caused by the 1943 flood. Recurrence of these and the occurrence of still larger floods are to be anticipated unless preventive measures are undertaken. From this the Board concludes that the flood problem is a serious one and that large expenditures to remedy it are justified. The Board concurs with the division engineer that by retention for the various uses enumerated, the surplus waters which cause these floods can be made to return very large benefits. The plan presented to serve these multiple purposes would provide the flood-plain lands included below Sioux City with complete protection from all floods of past magnitude.

11. In addition the plan would effect important reductions in flood stages along the Mississippi River below the mouth of the Missouri.

Thus, the proposed Missouri River Basin reservoirs, operated in coordination with the authorized reservoirs in the Ohio, Arkansas, and other basins would become an important and beneficial part of the flood-control system of the lower Mississippi River. Use of the stored water for multiple purposes would also improve low-water flows in the Mississippi River thereby saving considerable dredging costs for the 9-foot navigation channel. Improvement of the low water flow would assist in providing a 12-foot depth in the Mississippi River, study of which has been requested by the Committee on Rivers and Harbors of the House of Representatives.

12. Because of the many interests involved and uncertainty as to the manner in which this important section of the United States may develop in the future, the Board considers it impracticable at this time to make a detailed monetary estimate of the benefits which will accrue from the comprehensive plan. Considering the potentialities of the Missouri River Basin, the Board expects a continued expansion of its economic activities and considers the proposed plan as an advisable aid in that connection. It is certain that the benefits from the work will be very great and widespread. After thorough consideration the Board concludes that the United States will profit by undertaking the improvements as recommended by the division engineer on a step-by-step basis.

13. Accordingly, the Board recommends modification of the approved general comprehensive plan for flood control and other purposes in the Missouri River Basin to include 12 additional multiple-purpose reservoirs, works to divert water to the Devils Lake and James River Basin regions, and a system of levees and similar improvements along the Missouri River between Sioux City and the mouth, in general accordance with the plan

of the division engineer as shown on the accompanying map with such modifications thereof and changes therein as the Secretary of War and Chief of Engineers may find advisable, at an estimated cost to the United States of $481,600,000 for these additional works, the improvements to be constructed and, except for the levees and appurtenances, operated and maintained by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers; subject to the condition that no expenditures shall be made for the construction of any levee unit and appurtenant works recommended herein until local interests (*a*) provide without cost to the United States, all land, easements, and rights-of-way necessary for construction of said levee unit and appurtenant works; and (*b*) agree to hold and save the United States free from damages due to the construction of the levees and appurtenant works; and (*c*) agree to maintain and operate the levees and appurtenant works after completion, such maintenance to include cutting grass, removal of weeds, local drainage, and minor repairs. The Board further recommends that in addition to previous authorizations of funds there be authorized for appropriation, funds sufficient to provide for initiation and prosecution of the expanded general comprehensive plan in logical steps.

For the Board:

JOHN J. KINGMAN,
Brigadier General, United States Army,
Senior Member.

REVIEW OF REPORTS ON THE MISSOURI RIVER BASIN

SYLLABUS

Approximately 1,800,000 acres of land along the Missouri River between Sioux City and the mouth are subject to destructive floods. This area is predominately agricultural; however, portions of Sioux City, Iowa;

Council Bluffs, Iowa; Omaha, Nebr.; the Kansas Citys in Kansas and Missouri, and many smaller municipalities are also subject to flooding in some degree.

Several major floods have occurred during the past 100 years. These include the floods of 1844, 1881, 1903, and three severe floods so far during 1943. The damages caused so far during 1943 are estimated to be about $35,000,000.

Between Sioux City and the mouth, the river is being improved for navigation. Prior to the construction of river-improvement works, the river meandered from bluff to bluff, and caused serious damage to farm property by bank erosion and channel cut-offs. The river-improvement works have now stabilized the banks and provided a fixed channel in the flood plain, thus eliminating the previous hazards due to bank erosion and cut-offs. However, the flood hazard remains.

In an attempt to provide flood protection for their lands, local interests have constructed levees and drainage works throughout the reach from Sioux City to the mouth. It is estimated that the total amount expended on these works to date is in excess of $20,000,000. However, the levees are generally inadequate to protect against any except the minor floods, and have not been constructed in accordance with any unified, correlated plan.

Local interests are anxious to secure a much greater degree of protection than they now have, but consider that the problem is of such magnitude that the burden must be assumed by the Federal Government. There is no question but that the additional flood protection is needed and justified. Although a considerable increase in the amount of protection now afforded can be provided by levees, it is impracticable to provide complete protection against all past floods by levees alone. However, complete protection against all past floods can and should

be provided by a system of levees supplemented by reservoirs.

The plan proposed herein would provide for a series of levees and appurtenant works along both sides of the Missouri River from Sioux City to the mouth, supplemented by the presently authorized reservoirs in Nebraska, Kansas, and Missouri, and additional multiple-purpose reservoirs. The estimated cost of the levee project is $80,000,000 and of the additional multiple-purpose reservoirs is $410,000,000.

It is recommended that the general comprehensive plan for flood control and other purposes in the Missouri River Basin be expanded to include the plan as proposed in this report.

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
MISSOURI RIVER DIVISION,
Omaha, Neb., August 10, 1943.

Subject: Report on review of the reports on the Missouri River Basin.

To: The Chief of Engineers, United States Army, Washington, D.C.

I. INTRODUCTION AND GENERAL DESCRIPTION

1. *Authority for report.*—This report is submitted in compliance with the following resolution of the Committee on Flood Control, House of Representatives, adopted May 13, 1943.

That the Board of Engineers for Rivers and Harbors, created under section 3 of the River and Harbor Act approved June 13, 1902, be and is hereby requested to review the reports on the Missouri River contained in House Document No. 238, Seventy-third Congress, second session, and House Document 821, Seventy-sixth Con-

gress, third session, with a view to determining whether any modification should be made therein at this time with respect to flood control along the main stem of the Missouri River from Sioux City, Iowa, to its mouth.

2. *Arrangement of report.*—The report contains the following parts:

MAIN BODY OF REPORT

I. Introduction and general description.

II. Flood characteristics.

III. Flood problem.

IV. Proposed flood-control plan.

V. Economic justification and discussion.

VI. Conclusions.

VII. Recommendations.

APPENDIXES

I. Maps and charts.[1]

II. Transcript of public hearings.[2]

3. *Scope of report.*—In the preparation of this report, the "308" report on the Missouri River, House Document 238, Seventy-third Congress, and the report on the Missouri River from Sioux City, Iowa, to Kansas City, Mo., House Document 821, Seventy-sixth Congress, were reviewed. In addition, the following were also utilized: Other reports prepared by this Department, reports of other agencies, flood-damage investigations, hydrographic surveys, studies of aerial photographs of the alluvial valley, special field investigations and compilation of known survey data and other information available in the Department.

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[1] Only pl. 16 as printed.

[2] Not printed.

4. Public hearings to determine the views and suggestions of local interests were held at Washington, Mo., on June 8, 1943; at Onawa, Iowa, on June 9, 1943; at Nebraska City, Nebr., on June 10, 1943. Data for this report were prepared by the Kansas City and Omaha districts and correlated by the Missouri River division.

5. *General description of the basin.*—The Missouri River is formed by the confluence of the Gallatin, Madison, and Jefferson Rivers at Three Forks, Mont., and flows generally east and south about 2,460 miles to its confluence with the Mississippi River about 17 miles above St. Louis. The drainage area of the basin is 529,350 square miles, including 9,715 square miles in the Dominion of Canada. That portion of the drainage area located within the United States includes all of the State of Nebraska and portions of the States of Montana, Wyoming, North Dakota, South Dakota, Minnesota, Colorado, Iowa, Kansas, and Missouri.

6. Most of the area within the Missouri River Basin is gently rolling or plains country. The Ozark Mountains in Missouri, the Black Hills in South Dakota, and the Rocky Mountains which form the western boundary of the basin are the principal mountainous areas in the basin. In the reaches of the Missouri River above Fort Benton, the river generally flows through narrow valleys and canyons with banks composed of rock and gravel. Between Fort Benton and Sioux City, Iowa, the Missouri River flows through a valley from 1 to 10 miles in width, with easily eroded banks and an unstable channel.

7. *General description of basin below Sioux City.*—The drainage area of the Missouri River above Sioux City is 314,617 square miles, and below Sioux City it is 214,733 square miles. Between Sioux City, Iowa, and the mouth, the principal tributaries are the Platte and Kansas Rivers, whose principal drainage areas are, respectively, in Nebraska and Kansas, and the Grand,

Osage, and Gasconade Rivers, whose principal drainage areas are in Missouri.

8. Below Sioux City the bluffs along the valley are steeply rolling to nearly vertical and rise from 150 to 300 feet above the valley floor. The valley width varies from 1½ to 17 miles. The average width of the valley is about 5 miles. The valley-floor elevations vary from approximately 420 feet mean sea level at the mouth to approximately 1,100 feet mean sea level at Sioux City.

9. The average rainfall for the area between Sioux City, Iowa, and the mouth varies from about 26 inches at Sioux City to about 40 inches near the mouth. The regimen of the Missouri River is characterized by wide variations between maximum and minimum discharges. In the reach of the river between Sioux City, Iowa, and the mouth, records of river stages are available since 1872. However, except for the period 1870 to 1891, discharge measurements have been obtained at stations along this reach of the river only since about 1928.

10. The area along the Missouri River between Sioux City, Iowa, and the mouth is predominately agricultural. Dairying and truck gardening are carried on extensively near the large municipalities. In the larger municipalities there is considerable industrial development. The area has well-developed railroad and highway facilities. There is an existing 6-foot navigation project from Sioux City, Iowa, to the mouth. Commercial navigation has been carried on below Kansas City, Mo., for many years and to Omaha, Nebr., for several years prior to the war. Several commercial towboats formerly operating on the Missouri River have recently been withdrawn for use on the Mississippi and other inland waterways to assist in relieving the critical transportation problems in the East. However, when towing equipment is available waterborne transportation will be available to the entire area under investigation.

11. *Pertinent existing and authorized Federal projects.*—The existing navigation project between Sioux City, Iowa, and the mouth resulted from authorization contained in acts of Congress dated July 25, 1912; August 8, 1917; March 3, 1925; and January 21, 1927. The existing project provides for securing a navigable channel with a minimum low-water depth of 6 feet, by means of bank revetment, permeable dikes to contract and stabilize the waterway, removal of snags, and occasional dredging. The project is about 97 percent complete between Kansas City, Mo., and the mouth, and about 90 percent complete between Sioux City, Iowa, and Kansas City, Mo. Further new construction has been deferred in order to conserve critical materials and manpower for the war effort. The navigation works, although not completed, have already stabilized the banks of the river, eliminated the constant shifting of the channel, and greatly reduced bank erosion.

12. The Fort Peck Dam in Montana was authorized by the River and Harbor Act of August 30, 1935. The Fort Peck Dam, with a gross reservoir capacity of about 19,500,000 acre-feet, was constructed primarily for assuring adequate navigation depths downstream. The dam was essentially completed in 1939. The reservoir is operated to store excess water during the high-water season for later release to augment the flow during low-water periods. A hydroelectric power plant at the Fort Peck Dam was authorized by the act of Congress of May 18, 1938. On June 30, 1943, one 35,000 kilowatt unit was placed in operation. Operation of the project not only provides water for navigation and the generation of power for irrigation and other purposes, but produces large flood-control benefits by storing excess flows during high-water periods.

13. Under the Flood Control Act of June 28, 1938, the general comprehensive plan for flood control and other purposes in the Missouri River Basin as set forth in

Flood Control Committee Document No. 1, Seventy-fifth Congress, first session, was approved, and $9,000,000 authorized for reservoirs for the initiation and partial accomplishment of the plan. Construction work has been started on one reservoir project only, the Kanopolis Dam on the Smoky Hill River in central Kansas, at an estimated total cost of $9,000,000. Completion of the construction work on this dam has been deferred in order to conserve critical materials and manpower.

14. Under the Flood Control Act of August 18, 1941, there was authorized to be appropriated in addition to previous authorizations, $7,000,000 for the prosecution of the comprehensive plan approved in the act of June 28, 1938, including the Harlan County Reservoir on the Republican River in Nebraska and such other supplemental work on the Republican River as the Secretary of War and the Chief of Engineers may find advisable. The plan presented in this report provides for necessary and desirable dams on tributaries of the Republican River as well as the Harlan County Dam on the main stem of that river as authorized in the Flood Control Act of 1941.

15. A system of levees along the Missouri River between Sioux City, Iowa, and Kansas City, Mo., and a bank-erosion project just above Sioux City were authorized by the Flood Control Act of 1941, substantially in accordance with the plans presented in House Document 821, Seventy-sixth Congress, third session. The plan included in House Document 821 would provide protection against discharges similar to those which occurred during the 1938 flood.

16. A project for protection of the Kansas Citys of Kansas and Missouri was authorized for construction in the Flood Control Act of 1936, "in accordance with plans approved by the Chief of Engineers on recommendation of the Board of Engineers for Rivers and Harbors and as amended by further surveys and studies now in progress * * *." Construction of some of the units of this project

was started but has since been deferred in order to conserve critical materials and manpower for the war effort. Further studies have been made and a survey report dated June 27, 1942, has been submitted to the Chief of Engineers. The report of June 27, 1942, proposes modification of the plan used as a basis for the authorization in the Flood Control Act of 1936 to include a cut-off at Liberty Bend, near the Kansas Citys, and various changes in alinement and height of the protective works. The plans presented in the report of June 27, 1942, were discussed at the hearings of the Flood Control Committee in June 1943.

II. FLOOD CHARACTERISTICS

17. *General.*—The Missouri River between Sioux City, Iowa, and the mouth is subject to two general periods of high water each year. The first is often referred to as the March rise. It is caused by the rapid melting of snow in the Plains areas in Montana, Wyoming, and the Dakotas and the break-up and melting of the ice in the main stem and its tributaries. This melting of snow and ice occurs in a relatively short period of time and turns into flowing water the moisture that has been held back throughout the winter months in the form of snow and ice. This high-water period is usually accompanied by a relatively small amount of precipitation. It is characterized by relatively sharp peaks, although the volume of water during this high-water period is considerable. Due to the fact that this rise is ordinarily accompanied by very little precipitation, the crest flattens as it continues downstream, and floods from this rise are usually most severe in the upper part of the river. An example of a March rise flood is the one that occurred during the spring of 1943. This rise produced stages higher than any since the 1881 flood from Pierre, S. Dak., to Rulo, Nebr.

18. The second general period of high water is often referred to as the June rise. This high-water period oc-

curs subsequent to the March rise and is produced by the combined run-off from two sources: (1) the melting of snow from the mountains in the headwaters regions, which persists for a comparatively long period of time (2 or 3 months), and (2) run-off from rainfall occurring in the basin. Floods from this rise are ordinarily most severe in the lower part of the basin where the rainfall is normally the greatest. The run-off from excessive snow melt from the headwaters regions, combined with run-off from heavy rainfall in the basin, produces floods of major proportions. Examples of this type of flood are those which occurred in 1844 and 1903.

19. The Missouri River Valley is also subject to flash floods which occur at various times during the year. Many of these flash floods reach major proportions for considerable distances along the river and usually occur as a result of heavy run-off from local tributaries or from local ice jams. Practically every year there is some flooding along the Missouri River from Sioux City to the mouth as a result of flash floods.

III. FLOOD PROBLEM

20. *Agricultural areas subject to floods.*—Between Sioux City, Iowa, and the mouth there are about 1,800,000 acres of land subject to flooding at extreme stages. Most of this area is under cultivation at the present time and includes some of the most fertile and productive land in the world. The principal crops grown are corn, wheat, barley, rye, oats, alfalfa, and garden produce. Although the land is highly productive, floods on the Missouri River have always constituted a serious hazard to farming. Previous to the construction of river improvement works, the land was not only subject to floods but to damage by bank erosion and cut-offs. The threat from bank erosion and cut-offs has now been removed by the river stabilization works, but the flood hazard still remains.

21. *Municipal areas subject to floods.*—The principal cities subject to flooding are the Kansas Citys in Kansas and Missouri; Council Bluffs, Iowa; Omaha, Nebr.; and Sioux City, Iowa.

(*a*) The Kansas Citys, with a total population of over a half million people, include in the bottom lands subject to floods the stockyards which are the second largest in the world, many manufacturing and industrial establishments, important rail lines and highways, two airports, and the entire municipality of North Kansas City, Mo.

(*b*) At Council Bluffs, Iowa, a city of of more than 40,000 population, over half the city would be inundated in a major flood, including important railroads, manufacturing and industrial establishments.

(*c*) At Omaha, Nebr., a city of over 200,000 population, the municipal airport is located within the flood plain, also important manufacturing and industrial plants, and the entire village of Carter Lake, Iowa, which includes about 1,250 families.

(*d*) At Sioux City, Iowa, a city of over 80,000 population, a portion of the business district is subject to flooding, and also a large part of the stockyards, railroad facilities, and some manufacturing and industrial establishments.

In addition to these cities, there are over 50 smaller municipalities which are wholly or partially vulnerable to floods along the main stem of the Missouri River.

22. *Floods.*—In the upper part of the river the highest flood of record was caused by the March rise of 1881. Practically the entire area from bluff to bluff was inundated from Sioux City, Iowa, to St. Joseph, Mo., and the river was above flood stage all the way to the mouth. In addition to the damage caused by the water itself, there was a great deal of damage done by the cutting and crushing action of huge cakes of ice as they were swept down-

stream. When reservoirs are constructed upstream from Sioux City, this type of damage will be largely eliminated. The flood of 1881 caused millions of dollars of damage.

23. In the lower part of the river the highest flood of record was caused by the June rise of 1844. This flood also produced stages in the upper part of the river approaching those of the 1881 flood. Reliable records of the damage caused by this flood are not available. The next highest flood of record in the lower part of the river was caused by the June rise of 1903. This flood paralyzed commerce, industry, and communications for weeks and caused millions of dollars of damage at the Kansas Citys alone. It flooded the entire bottoms area on which is now located hundreds of industrial and manufacturing plants and the airports. The total direct damage during this flood between Sioux City and the mouth was over $10,000,000.

24. In addition to the floods of 1844, 1881, and 1903, there have been many other severe floods between Sioux City and the mouth, such as those which occurred during 1908, 1909, 1915, 1927, 1935, 1942, and 1943. In fact, there is flooding of some consequence practically every year on the Missouri River between Sioux City and the mouth.

25. Individual farmers, groups of farmers, levee districts, and drainage districts have constructed levees at many locations between Sioux City and the mouth in an attempt to safeguard their lands and property. Accurate figures are not available as to the total amount expended by local interests on levees and drainage works in their efforts to provide flood protection, but it is estimated that these expenditures have exceeded $20,000,000. The levees have been successful in protecting against some of the minor floods, but have not been adequate to withstand the more severe floods.

26. The March rise of 1943 produced a major flood in the upper part of the river under investigation. The resulting stages were higher than any experienced since 1881. Levees were breached all the way from Sioux City to Kansas City. Then in May, as a result of heavy rainfall, a major flood occurred in the lower part of the river. Stages below the mouth of the Osage River were, in general, higher than those of the 1903 flood. This flood breached or overtopped most of the levees between Jefferson City, Mo., and the mouth. Following this flood and as a result of additional heavy rainfall, another severe flood occurred in June which extended all the way from Nebraska City to the mouth, with stages from Waverly, Mo., to Glasgow, Mo., approximating those of the 1903 flood. This flood caused the breaching or overtopping of practically all of the levees between Kansas City and Jefferson City which had not previously failed.

27. The floods of 1943 have caused damages so far of about $35,000,000 along the main stem of the Missouri River between Sioux City and the mouth. About 1,000,000 acres of land have been inundated, of which about 200,000 acres were flooded for the second time. On about 600,000 acres the flooding prevented the production of the normal crop, and on about 300,000 acres it may require from 1 to 3 years before the land can be placed into full normal crop production. Highways and railroads in the river valley suffered heavily. Practically every agricultural levee between Sioux City and the mouth was either overtopped, breached, or otherwise seriously damaged. Many of these levees had been previously damaged by the high water of 1942, and repaired either by the local interests or by the Federal Government under the provisions of section 5 of the 1941 Flood Control Act. The amount expended under provisions of section 5 of the 1941 Flood Control Act amounted to approximately $300,000. All this effort and expense was nullified by the 1943 floods. In addition, the Engineer Department ex-

pended over $800,000 for rescue and emergency work during the 1943 floods.

28. Under the provisions of section 5 of the 1941 Flood Control Act and Public Law 138, Seventy-eighth Congress, approved July 12, 1943, the Department is now assisting local interests in the restoration of their damaged levees. The estimated cost of restoring the levees damaged during the 1943 floods to their original degree of protection is approximately $1,800,000.

29. *Desires of local interests.*—For years the desire for adequate flood protection has been voiced by local interests in their contacts with the Engineer Department. In 1939, following an organized effort on the part of local interests between Sioux City and Kansas City, an investigation was authorized by resolution of the Committee on Commerce, United States Senate, to determine whether any modification should be made in the report on the Missouri River contained in House Document 238, Seventy-third Congress, second session, with respect to flood control along the main stem of the Missouri River from Sioux City, Iowa, to Kansas City, Mo. As a result of this investigation, Congress authorized a system of levees between Sioux City and Kansas City which would provide protection against a flood similar to that of 1938. However, no money was ever appropriated to construct works authorized under this authorization.

30. Discouraged by the apparent futility of restoring and repairing existing private levees, only to have them breached or overtopped time and again, and realizing that the 1943 floods would have breached or overtopped the levees authorized in the 1941 act had they been constructed, local interests have asked for a restudy of the problem. This resulted in the congressional resolution authorizing the present report.

31. Local interests are definitely of the opinion that more adequate protection than is provided by existing

works is necessary. They also are convinced this must be accomplished through some unified and well-coordinated plan, and that the problem is of such magnitude that the burden must be assumed by the Federal Government. This general attitude is reflected in the discussions in the public hearings held in connection with this report (see appendix II),[2] by numerous resolutions adopted by local organizations and by the many recent contracts with local interests in connection with repair of levees under provisions of section 5 of the 1941 Flood Control Act.

IV. PROPOSED FLOOD CONTROL PLAN

32. The plan of flood control proposed herein consists of a series of levees and appurtenant works along both sides of the river from Sioux City, Iowa, to the mouth of the Missouri River, supplemented by the presently authorized reservoirs in Nebraska, Kansas, and Missouri, and additional multiple-purpose reservoirs, including reservoirs above Sioux City. This plan would provide flood protection for agricultural lands along both sides of the river and protection for the cities of Sioux City, Iowa; Council Bluffs, Iowa; Omaha, Nebr.; and the Kansas Citys, Kans. and Mo. A plan for the protection of the Kansas Citys is described in a survey report prepared by the district engineer, Kansas City, dated June 27, 1942, and no change in that plan is proposed herein. The general alignment of the proposed levees is shown on sheets 1 to 9 and the proposed profile of the design flood is shown on sheets 10 to 15, appendix I.[1]

33. In determining the degree of protection which should be provided by the levees, the following factors were considered:

(*a*) The effect on future flood discharges of the operation of the system of authorized reservoirs in the lower part of the basin.

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[1] Only pl. 16 is printed.

[2] Not printed.

(*b*) The effect on future flood discharges of the operation of multiple-purpose reservoirs upstream from Sioux City.

(*c*) The height to which it is practicable to construct earth levees along the Missouri River without danger of destruction by foundation failure or by development of sand boils.

(*d*) The amount of set-back of the levees which would be required to provide adequate floodway capacity.

34. Flood discharges are usually greatest in the lower part of the river, which area normally receives the greatest amount of rainfall. Also the valley in the lower end is considerably narrower than in the upper part. Consequently, the relative degree of protection which can be economically provided by levees alone is considerably less in the lower part of the river than in the upper river. This emphasizes the need for completion of the reservoirs now authorized for the lower part of the river.

35. Complete protection against all floods of record by levees alone is impracticable. However, the levees proposed herein, supplemented by the presently authorized reservoirs in the lower part of the basin and the additional multiple-purpose reservoirs would provide protection between Sioux City, Iowa, and the mouth against all past floods of record.

36. The proposed levees for protecting agricultural areas would be of earth fill, with a 10-foot crown width, and side slopes of 1 on 3 on the river side and 1 on 5 on the land side, with a 2-foot freeboard above the design flood after settlement. Drainage structures would be placed through the levees as required to drain interior run-off. Where required, by foundation conditions or other special reasons, rolled fill levees would be constructed. Proposed floodway widths between levees would vary from a minimum of 3,000 feet from Sioux City,

Iowa, to Kansas City, Mo., and 5,000 feet from Kansas City, Mo., to the mouth.

37. At places where there is a concentration of population and property values, such as at Sioux City, Iowa; Omaha, Nebr.; Council Bluffs, Iowa; and Gasconade Boatyard in Missouri, the levees would be rolled fill with 10-foot crown width and side slopes of 1 on 3 on the river side and 1 on 4 on the land side, with a 3-foot freeboard above the design flood. Where space is not available for levees, concrete flood walls would be constructed. Drainage structures would be provided through the levees and where necessary pumping plants would be provided to care for drainage during flood periods. Floodway widths at municipal and special areas would be determined by economic considerations.

38. The plan for control of bank erosion above Sioux City, Iowa, presented in House Document 821, Seventy-sixth Congress, third session, was reconsidered; however, no change in that previously recommended is considered necessary at this time. The plan for the protection of the Kansas Citys as contained in the report referred to in paragraph 32 was also reviewed and no change in the plans proposed therein is considered necessary.

39. *Levee costs.*—The estimated cost of the levees and appurtenant works as proposed herein is as follows: [3]

[Table Omitted in Printing]

40. The design flood profile and location of the proposed levees as submitted with this report are sufficiently accurate for the purpose of estimating costs; however, before construction is initiated, final design flood profiles and the exact locations of the levees should be correlated with the latest data available on the comprehensive plan of development.

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[3] Exclusive of the costs for protection at the Kansas Citys, which costs are shown in table 2, par. 48.

41. Although protection against all past floods of record cannot be accomplished by levees alone, complete protection can and should be provided by completing the reservoirs authorized in the lower part of the basin and by constructing additional reservoirs including reservoirs above Sioux City. In order to provide for the maximum utilization of the waters of the basin, the reservoirs proposed above Sioux City should be multiple-purpose projects. Studies of multiple-purpose projects above Sioux City show that the following should be included as a part of the comprehensive plan of development for the Missouri River Basin:

[Table Omitted in Printing]

42. In connection with the proposed Garrison Reservoir, a practical solution to a situation which has long existed in the States of North and South Dakota and which periodically causes much trouble is possible. During excessively dry years the regions in the vicinity of Devils Lake and the James River Basin become so short of water that animals are subjected to great suffering and the people to severe hardship. Droughts almost, if not entirely, destroy animal and plant life in these areas. The best over-all use of the multiple-purpose reservoirs would permit a feasible diversion of water from the Missouri River into the Dakotas for domestic use and other purposes. First there must be conserved and stored in the Missouri Basin enough water to provide this diversion. The plan proposed herein provides for such storage in the reservoirs listed in the preceding paragraph. By the time that water is available, there should also be completed pumping facilities and conduits needed to provide the Devils Lake and James River regions at least as much water as they now have during seasons of normal rainfall. Later this flow of water can be increased to provide much additional irrigation. The plan herein contemplates that there shall be started improvements to provide a diversion of water from the Missouri River into the Da-

kotas and that this diversion should be progressively increased and improved as time and conditions warrant such improvements. The location of the facilities for the first phase of this improvement is indicated on the map accompanying this report.

V. ECONOMIC JUSTIFICATION AND DISCUSSION

43. The damage caused by the 1943 floods alone on the Missouri River between Sioux City and the mouth is estimated to be about $35,000,000, or almost one-half of the cost of the proposed levee project.

44. The total value of the area subject to floods along the Missouri River between Sioux City and the mouth, including all fixed and movable property, has been estimated to be about $1,000,000,000.

45. The comprehensive plan proposed herein would provide not only complete protection for this area against all past floods on the Missouri River, but would effect important reductions in flood stages on the lower Mississippi River. In addition to providing flood-control benefits on the Missouri and Mississippi Rivers, the comprehensive plan would also provide for the most efficient utilization of the waters of the Missouri River Basin for all purposes, including irrigation, navigation, power, domestic and sanitary purposes, wildlife, and recreation.

46. Furthermore, the plan would provide many intangible benefits including:

(1) The saving of lives.

(2) The alleviation of human suffering.

(3) A general stabilization of the economic life of the valley and of interstate commerce.

(4) The encouragement of industrial and civil developments.

47. The plan is unquestionably justified.

48. Although the construction of the comprehensive plan is justified and should be ultimately accomplished in its entirety, it is recognized that it would not be feasible to initiate the construction of all of the units at one time. Instead, the development should proceed in an orderly, step-by-step manner as circumstances and availability of funds permit. Units selected for the first phase of development should be those which would provide the greatest benefits from progressive step-by-step construction. This general scheme of progressive development has been successfully carried out on the Nile River and other rivers. On the Nile the Aswan Dam was originally a relatively low structure but has since been raised three times as the needs of the region warranted. Similarly, on the Mississippi River the plan for flood control has been modified several times to provide for an increased degree of flood protection. Table 1 shows projects to be authorized and included in the comprehensive plan. Table 2 shows projects already authorized.

[Table Omitted in Printing]

[Table Omitted in Printing]

49. In connection with the development of the multiple-purpose projects, those shown for the Missouri River will provide for the maximum practicable storage of water of the main stem. The water to be impounded in these, as well as the other multiple-purpose structures shown in tables 1 and 2, will be utilized to produce the maximum practicable development of irrigation, navigation, power, and other multiple purposes. However, sufficient storage will be provided in each reservoir to provide for the needs of local flood protection down-stream from the reservoir as well as for the needs of the general comprehensive plan for flood control for the Missouri River Basin. To provide for the maximum utilization of the waters stored in multiple-purpose reservoirs, a plan would be worked out for each structure in collaboration with the various water-use agencies involved. The amount of water to be made

available to the Bureau of Reclamation for irrigation would be arrived at after close collaboration with that agency. The development of power potentialities would be determined in cooperation with the Federal Power Commission. Water use for other purposes would be arrived at in a similar manner.

VI. CONCLUSIONS

50. It is concluded that the existing approved plan of improvement for the Missouri Basin should be expanded substantially as indicated herein to include in addition to the plan authorized under existing law, the following:

(*a*) A series of levees and appurtenant works along both sides of the Missouri River from the vicinity of Sioux City, Iowa, to the vicinity of the mouth of the Missouri River.

(*b*) The following multiple-purpose reservoirs: Five on the main stem of the Missouri River, five on the tributaries of the upper Republican River, one on the Big Horn River, and one on the Yellowstone River.

(*c*) A diversion from the vicinity of Garrison Dam into the Dakotas extending to the Devils Lake and the James River Basin regions together with the pumping stations, conduits, and other facilities necessary to supply water during drought seasons for the Devils Lake and James River regions.

VII. RECOMMENDATIONS

51. It is recommended:

(*a*) That the general comprehensive plan for flood control and other purposes in the Missouri River Basin approved by the act of June 28, 1938, as modified by subsequent acts, be expanded to include the plans presented herein and as expanded be approved for prosecution by the War Department under the direction of the Secretary of War and supervision of the Chief of Engineers with

such modifications thereof and changes therein as in the discretion of the Secretary of War and the Chief of Engineers may become advisable.

(*b*) That all reservoirs constructed under the approved plan shall be constructed, operated, and maintained by the War Department under the direction of the Secretary of War and the supervision of the Chief of Engineers.

(*c*) That no money appropriated for the prosecution of the works herein recommended shall be expended on the construction of any levee until States, levee districts, or local interests have furnished without cost to the United States all lands, easements, and rights-of-way for levees and have agreed that they will maintain the levees after their completion; maintenance includes normally such matters as cutting grass, removal of weeds, local drainage, and minor repairs.

(*d*) That in addition to previous authorizations for the Missouri River Basin there be authorized to be appropriated a sum adequate to provide for the initiation and prosecution of the expanded general comprehensive plan in a logical step-by-step manner.

LEWIS A. PICK,
Colonel, Corps of Engineers, Division Engineer.

APPENDIX B

78TH CONGRESS
2d Session

SENATE

DOCUMENT
No. 191

MISSOURI RIVER BASIN

CONSERVATION, CONTROL, AND USE OF WATER RESOURCES

OF THE

MISSOURI RIVER BASIN IN MONTANA, WYOMING, COLORADO, NORTH DAKOTA, SOUTH DAKOTA, NEBRASKA, KANSAS, IOWA, AND MISSOURI

(Report by Secretary of the Interior Harold L. Ickes on Bureau of Reclamation's Plan for Basin Development)

APRIL 1944

[LOGO]

PRESENTED BY MR. O'MAHONEY

MAY 5 (legislative day, APRIL 12), 1944.—Ordered to be printed with illustrations

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UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1944

MISSOURI RIVER BASIN

LETTER FROM THE BUREAU OF THE BUDGET

EXECUTIVE OFFICE OF THE PRESIDENT,
BUREAU OF THE BUDGET,
Washington, D. C., May 4, 1944.

The Honorable the SECRETARY OF THE INTERIOR.

MY DEAR MR. SECRETARY: I have your letter of May 1 transmitting a copy of the report entitled "Conservation, Control, and Use of Water Resources of the Missouri River Basin."

I am not now able to advise you, because of the need for further consideration of certain recommendations of the proposed report, as to the relation to the program of the President of the various recommendations therein.

Since I am advised, however, that the congressional committees having jurisdiction of pending legislation, to which these recommendations relate, are contemplating early consideration of such legislation, I am writing to say that this office would, of course, have no objection to your making the report immediately available for the consideration of these committees. In doing so, the committee should be informed, I think, that you have not received from this office advice as to the relation of the report recommendations to the program of the President.

Very truly yours,

HAROLD D. SMITH, *Director.*

LETTER FROM THE DEPARTMENT OF THE INTERIOR

DEPARTMENT OF THE INTERIOR,
Washington, May 1, 1944.

THE PRESIDENT,
The White House.

(Through the Bureau of the Budget.)

MY DEAR MR. PRESIDENT: There is transmitted herewith my report on the Missouri River Basin, which is the letter of April 28, 1944, of the Commissioner of Reclamation and its attachments, which I approve.

The report contemplates utilization of the waters of the Missouri River beneficially for multiple purposes in the stabilization of the agriculture and economy of this vast basin which includes the Northern Great Plains, where drought periodically deals devastation. The maximum degree of stabilization can be obtained only through full utilization of the waters of this river system.

The construction proposed in this report would be complementary, for the most part, to that recently suggested by the Secretary of War for flood control on the Missouri River. The two plans, while not identical, apparently can be successfully coordinated.

The initial stage proposed in this report would involve expenditures estimated at $200,000,000. The economic and human gains that can be expected will amply justify this step. The plan has engineering feasibility. Water users, rural and urban, would be expected to repay, in accordance with their ability and the benefits extended to them, parts of the costs, and I find that they probably can meet the charges indicated. Power users would be expected to repay additional parts of the costs. It reasonably can be expected that these returns to the United States Treasury will be effected. Flood control and navigation allocations would be non-reimbursable. Substantial and material benefits would accrue through recreational use of the waters and facilities proposed; through

their use in fish and wildlife conservation; through pollution abatement, silt control, and the recharge of lakes and ground waters. These are not assessable in monetary terms, and no repayments are contemplated from them.

I find desirable and feasible the development of the Missouri River Basin in accordance with this report on the Conservation, Control, and Use of the Water Resources of the Missouri River Basin, and I recommend authorization for construction after the war of the initial stage in accordance with the report and as contemplated in Section 9 of the Reclamation Project Act of 1939.

Sincerely yours,

HAROLD L. ICKES,
Secretary of the Interior.

LETTER FROM THE BUREAU OF RECLAMATION

DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Washington, April 28, 1944.

THE SECRETARY OF THE INTERIOR.

SIR: In accordance with section 9 of the act of August 4, 1939 (53 Stat. 1187, 43 U. S. C. 485), I transmit this report on Conservation, Control, and Use of the Water Resources of the Missouri River Basin.

I recommend it to you for your approval and for submission to the Congress, after submission to the Bureau of the Budget in accordance with section 4 of Executive Order 9384, and to the President in conformity with the 1939 act.

The reclamation plan proposes a total of 90 reservoirs with a combined capacity of 45,700,000 acre feet, most of the reservoirs on tributaries of the Missouri for use in irrigation, flood control, and power development, but two-thirds of the reservoir capacity on the main stream

for use in flood control, aid to navigation, power development, and irrigation.

When fully developed, the plan would provide water for the irrigation of 4,760,400 acres of dry land, and supplemental water for 538,000 acres of land now irrigated but not assured adequate water in years of low run-off. Seventeen power plants, in the completed power system, would supply seasonal power for pumping water for irrigation, and nearly four billion kilowatt-hours of firm power, annually, for domestic, commercial, and industrial uses.

The irrigation of numerous areas scattered widely over the Northern Great Plains and over other semiarid sections of the Missouri River Basin would add to an unavoidably precarious dry-farm and grazing economy the stabilizing influence of lands with insured crops and high yields.

The droughts of the last decade cost governmental agencies, principally Federal, a total of $1,246,557,087, and these expenditures were inadequate to the needs, since tens of thousands of families nevertheless were forced to migrate from their abandoned homes. These expenditures are roughly equal to the cost of full utilization of the waters of the Missouri River system. While it is not contended that full use of these waters will eliminate drought losses, it will reduce the catastrophic effects and prevent much of the human suffering.

I have submitted the report to the agencies of the Department of the Interior which have interests in the waters of the Missouri River Basin and have their approval or their comment, which is attached. I have submitted the report to the Interagency River Basin Committee, in accordance with the quadripartite agreement of December 29, 1943. I have the comment of the Corps of Engineers, which is also attached.

The Assistant Commissioner of the Office of Indian Affairs, on April 26, 1944, said with regard to the recom-

mendations made in the report dated April 14, 1944 of the Board of Review, that the Office of Indian Affairs should construct, operate and maintain irrigation features including dams that predominantly serve Indian lands. I concur in the opinion, and I am sure that the members of the Board of Review will regret their oversight in this connection. The report should recognize the authority and responsibility of the Office of Indian Affairs in the matter of irrigating Indian lands.

The Chief of Engineers, War Department, in his letter of April 25, 1944 observed that the Reclamation plan included tributary reservoirs that would fit the plan presented by the Corps of Engineers in House Document 475, Seventy-eighth Congress, second session, and commented that modifications made in the proposals for the Yellowstone, Big Horn, Kansas, Smoky Hill, and Republican River Basins could be coordinated in advance of construction by further cooperation by the Corps of Engineers and the Bureau of Reclamation. With regard to the main stem of the Missouri River, however, the Chief of Engineers noted that the reclamation plan contemplated 10,250,000 acre-feet less storage than had been proposed by the Corps, and concluded that a high dam at the Garrison site, which was not included in the reclamation plan, and a dam at Gavins Point, which was omitted from the reclamation plan, are necessary. The main stem dams, the Chief of Engineers said, should be built, operated, and maintained by the corps, and the tributary dams should be built, operated, and maintained by the agency with the dominant interest. Flood control storage should be utilized in accordance with regulations prescribed by the Secretary of War, and irrigation storage in accordance with regulations of the Secretary of the Interior, be proposed. The Chief of Engineers noted that irrigation of the Souris area, as proposed in the Reclamation plan, would require diversion of waters from the Missouri River, and he advised further study of this undertaking pending fulfillment of existing and foresee-

able needs within the Basin. He questioned the computations in the reclamation report of benefits and allocations.

I agree with the Chief of Engineers that details can be worked out satisfactorily through cooperation as the projects are constructed on the tributary streams. I agree that the agency with the dominant interest should construct the dams and other works in the Basin, and I agree that the main stem storage dams should be constructed by the corps, owing to their close relationship with flood control and navigation. The Reclamation plan provides a storage capacity in main stem reservoirs of 24,950,000 acre-feet, which is 10,250,000 acre-feet less than that proposed by the Corps, but when considered together with more than 10,000,000 acre-feet of storage provided upstream, this amount is believed to be sufficient to provide full flood protection and ample storage for regulation for navigation. However, if continuing studies by the Corps and the Bureau of Reclamation should indicate the need of additional storage in the main stem after the high dam at Oahe is built, then there is and should be ample opportunity to provide the additional storage needed. The Oahe Dam, as proposed, would provide a reservoir of a capacity of 19,600,000 acre-feet as against the Garrison Dam proposed by the Corps which would provide a reservoir of only 17,000,000 acre-feet. In any event, one of these would constitute the initial flood-control facility. It would appear that the Oahe Dam would be more desirable from the flood-control standpoint, as it is also from the irrigation point of view.

The regional report of April 1944 is covered by the report of April 14 of the Board of Review. I approve the findings, the comment, and the recommendations made in the report of the Board of Review.

I find that the proposed development of the Missouri River Basin is needed, as conclusively shown in the re-

port. The plan has engineering feasibility. The ultimate cost is estimated at $1,257,645,700, and the annual benefits of the completed development would be 2.57 times the annual costs. The annual benefits would be as follows:

Irrigation	$130,000,000
Power	17,141,000
Flood control	16,500,000
Navigation	4,165,000
Municipal water	500,000

Irrigation would be expected to repay in 40 annual payments $298,000,000. Power revenues in 50 years would repay $423,100,000, and municipal water users would repay $20,000,000.

The initial construction proposed would require $200,000,000 and would be dominantly for irrigation and power. It includes none of the features that would be constructed by the Corps of Engineers in the development of the basin, but it would complement the flood-control construction proposed by the Corps.

I recommend that the construction, repayment, operation, and maintenance of the works proposed be in accordance with this report. I recommend the approval and authorization of the initial stage for construction after the war substantially in accordance with this report, but with such modifications by the Secretary of the Interior and the Commissioner of Reclamation as may be required to meet developing needs.

Respectfully,

H. W. BASHORE, *Commissioner.*

LETTER FROM THE OFFICE OF INDIAN AFFAIRS

DEPARTMENT OF THE INTERIOR,
OFFICE OF INDIAN AFFAIRS,
Washington, D. C., April 26, 1944.

Mr. HARRY W. BASHORE,
Commissioner, Bureau of Reclamation.

DEAR COMMISSIONER BASHORE: I have examined the confidential copy of the Missouri River report you transmitted on April 20, 1944. This report, in my judgment, is an excellent presentation of the Missouri River Basin problem. I find myself in full agreement with your Bureau's recommendations concerning the priorities of irrigation, domestic and industrial use of the regulated flow of the Missouri River and its tributaries, especially in the upper part of the basin, and I hope that these priorities will be given congressional sanction.

Insofar as the Indian irrigation and power interests are concerned, the report seems to give them adequate consideration. However, I cannot agree with the recommendation of the Board of Review that "all works that may be authorized under the approved plan be constructed, operated, and maintained by the Bureau of Reclamation under the direction of the Secretary of the Interior wherever the dominant function of such works is other than navigation and flood control." This recommendation on page g of the report, is based on the discussion of the proposed division of operational authority in numbered paragraph 7, on page b. This paragraph proposes that, in effect, construction and operation of the features of the plan be divided between the Bureau of Reclamation and the Corps of Engineers on the basis of the dominant function of each feature, features in which navigation and flood control are the dominant functions to go to the Corps, all other features to be operated by the Bureau of Reclamation. The report in paragraph 7, adds: "In like manner, agencies with juris-

diction over other functions should be recognized." Inasmuch as the Office of Indian Affairs is exercising on Indian lands functions identical with those exercised by the Bureau of Reclamation on non-Indian lands, the language of the report seems to exclude the Indian Service from any participation in the planning, design, construction and operation of irrigation and power projects on Indian lands. I assume that this omission was unintentional and propose that it be corrected by changing the language of paragraph 7, page b, as follows: In line 9, after the words "All irrigation features" insert "except those on Indian lands or predominantly serving Indian lands which shall be constructed and operated by the Office of Indian Affairs." Similarly in line 12, at the end of the sentence reading "All reservoirs in which irrigation, restoration of surface and ground waters, or power, are dominant, should be operated by the Bureau of Reclamation" the following words should be added "except reservoirs on Indian lands or predominantly serving Indian lands which shall be operated by the Office of Indian Affairs."

Indian Service lands and irrigation projects are scattered throughout the Missouri River Basin. Many of the features proposed by the plan are in part or in whole based on Indian lands, affect Indian water rights and existing Indian irrigation projects. In order to make possible a reasonable degree of Indian Service participation in the planning, construction, and operation of those irrigation and power features vitally affecting Indian interests, I propose that language be added to paragraph (b) of the recommendations, on the bottom of page g, to make this recommendation read as follows:

(b) That all works that may be authorized under the approved plan be constructed, operated, and maintained by the Bureau of Reclamation under the direction of the Secretary of the Interior wherever the dominant function of such works is other than navigation and flood control,

except that the Office of Indian Affairs shall construct and operate those works on Indian lands or serving Indian lands predominantly.

I request that these modifications in the language of the report be made before the report is submitted to the Congress.

The modifications in the language are deemed necessary in order to protect the Indian interests under the Winters decision and the terms of the Leavitt Act. They bring the recommendations into line with the Departmental policy as laid down in the Secretary's report on Senate Joint Resolution 55, by Wheeler, to transfer all Indian irrigation functions to the Reclamation Bureau, a proposal vigorously opposed by the Department and your Bureau.

Sincerely yours,

WILLIAM ZIMMERMAN, JR.,
Assistant Commissioner.

LETTER FROM THE CHIEF OF ENGINEERS, WAR DEPARTMENT

WAR DEPARTMENT,
OFFICE OF THE CHIEF OF ENGINEERS,
Washington, April 25, 1944.

Mr. H. W. BASHORE,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D.C.

MY DEAR MR. BASHORE: Receipt is acknowledged of your letter of April 20, 1944, transmitting copies of your report on the Missouri River Basin and requesting comment thereon by April 25, in order that the report may be submitted to the Bureau of the Budget on the scheduled date of May 1, 1944.

The general comprehensive plan of this Department for flood control and other purposes as contained in House

Document No. 475, Seventy-eighth Congress, contemplated that that plan would be augmented by appropriate projects of other agencies duly constituted by law to perform such work. It appears that the upstream tributary reservoirs proposed in the report of the Bureau will fit into the expanded comprehensive plan for flood control and other purposes, provided main stem storage is not substantially reduced.

I note that your plan substitutes the Mission Dam for the Livingston project included in House Document 475 and greatly reduces the size of the Boysen Dam. Further studies by the Bureau of Reclamation and the Corps of Engineers preparatory to construction can definitely establish the developments for the Yellowstone and Big Horn Basins.

Similarly the plan in your report for the Kansas River Basin, including the Republican and Smoky Hill Rivers, differs in some details from the War Department's plan as reported in House Document 475. In this river basin the fundamentals of the two plans are similar and I believe that the details can be worked out satisfactorily through cooperation as the projects are constructed.

With regard to the main stem dams in North and South Dakota, it is noted that the Bureau's report contemplates 10,250,000 acre-feet less storage than proposed in House Document 475. Since reservoirs on the main stem are the most beneficial from the standpoint of flood control below Sioux City and are vitally needed for cyclic storage, I consider that the maximum practicable amount of storage must be provided on the main stem in North and South Dakota. In this connection the plan outlined in House Document 475 makes possible the inclusion of a high dam at Oahe if found feasible from an engineering and economic standpoint. In any event a high dam at the Garrison site is essential, and a reregulating reservoir at Gavins Point is necessary.

Although I am not convinced that storage in reservoirs far upstream on the headwater tributaries would have appreciable effects on flood stages along the main river below Sioux City and on the Mississippi River, I agree that those projects would be of great benefit to agriculture, to the prevention of local flood damages downstream from the dam sites and to the solution of silting problems.

It is noted that your plan includes the irrigation of approximately 1,000,000 acres in the Souris project outside of the Missouri River Basin. The best over-all use of the multiple-purpose reservoirs in the Missouri River Basin would permit a diversion of water out of the basin into the Dakotas, urgently needed for domestic use and for other purposes, after sufficient water has been conserved and stored to provide for such diversion. However, until the existing and foreseeable needs for the conservation and use of water within the Missouri River Basin have been satisfied there is a question in my mind as to the advisability of developing a large-scale irrigation project outside the Missouri River Basin which would deprive the basin of a part of its natural water supply. In my opinion the advisability of such a large diversion should be the subject of further study and consideration.

The time available has not permitted a thorough study of the allocation of costs and benefits as contained in your report. I can state, however, that in view of the information contained in your report that the projects proposed will provide a dependable low water flow at Sioux City of something less than now exists, I do not understand the equity of charging to navigation a large part of the cost of the development. Also I question your method of computing flood-control benefits. It is noted that by the methods used the costs allocated to flood control and navigation under the heading "Repayment and returns" are very large compared to costs allocated to irrigation, whereas irrigation benefits are represented as several times the combined benefits to flood control and navigation.

It is essential that the main stem reservoirs in North and South Dakota be built, operated, and maintained by the Corps of Engineers as stated in my report and in your letter of December 17, 1943, both printed in House Document 475. Tributary reservoirs should, when advisable from the standpoint of basin-wide development, be constructed, operated, and maintained by the agency with dominant interest under existing law. In all reservoirs, utilization of storage for flood control should be in accordance with regulations prescribed by the Secretary of War and utilization of storage for irrigation should be in accordance with regulations prescribed by the Secretary of the Interior.

As stated before, my report contained in House Document No. 475 contemplates that the broad framework for the Missouri Basin as recommended in that document will be augmented by appropriate work of other agencies duly constituted by law to perform such work. I am sure that through the continued cooperative efforts of all concerned the details of the improvements can be worked out in a progressive manner as conditions warrant. I appreciate the opportunity to comment on the Bureau's report and I look forward with confidence to the development of the comprehensive and flexible plan for the Missouri Basin through the coordinated and cooperative efforts of Federal, State, and local agencies to accomplish the best overall use of its water resources.

Very truly yours,

E. REYBOLD,
Major General,
Chief of Engineers.

LETTER FROM THE DEPARTMENT OF AGRICULTURE

DEPARTMENT OF AGRICULTURE,
Washington, April 25, 1944.

Mr. H. W. BASHORE,
Commissioner, Bureau of Reclamation,
Department of the Interior, Washington, D.C.

DEAR MR. BASHORE: We received from Maj. Gen. E. Reybold, Chief of Engineers, War Department, on April 22, a copy, marked "confidential," of the Missouri River Basin report of the Bureau of Reclamation with the telephone request that we transmit our comments on it to you by April 25 in order that you might submit the report to the Bureau of the Budget by May 1, 1944.

The responsibilities of this Department do not, of course, embrace the design or construction of major engineering works for irrigation, flood control, power, and other purposes, but we are very much interested in land and water development and use of concern to agriculture and rural people. The benefits from soundly conceived irrigation, power, flood control, navigation, wildlife, recreation, and other multiple-purpose development on the Missouri and its tributaries will accrue in considerable measure to farm people and rural interests and will have a direct bearing on the use made of the national resources of the area. In particular, the potentialities of providing irrigation where economically feasible to farming areas of low or uncertain rainfall are large and important in the Northern Great Plains.

The short time available has permitted only a very general review of the report. We are glad to see that many of the projects proposed in the report appear to be essentially in harmony with those that have been proposed by the Corps of Engineers, War Department. We are not in position to judge the relative engineering merits of such proposals as are not reconciled but believe that through continued cooperative consideration by the

agencies concerned a mutually acceptable means can be found to meet the broad objectives of both reports.

Various programs of the Department will be of material assistance in the achievement of the agricultural objectives in the coordinated plan for basin-wide development. We shall be glad to cooperate to the full extent our resources permit.

Sincerely,

E. H. WIRCKING,
Land Use Coordinator.

LETTER FROM THE FISH AND WILDLIFE SERVICE

DEPARTMENT OF THE INTERIOR,
FISH AND WILDLIFE SERVICE,
Chicago, Ill., May 6, 1944.

Mr. H. W. BASHORE,
Commissioner, Bureau of Reclamation,
Washington, D.C.

MY DEAR MR. BASHORE: Reference is made to your letter of May 2 asking for any comment we may have to offer in regard to your report, "Conservation, control, and use of water resources of the Missouri River Basin."

I regret to say that this report was not received in our Chicago office early enough for us to review it carefully before your deadline on May 1. As yet we have had opportunity to make only a casual examination of the report, but we feel that in the main it is a good report and considers well the interests of the various agencies.

Thus far, there is only one statement to which exception might be taken, and that perhaps would depend upon interpretation of your statement. I refer to a statement in the report of the Board of Review. We heartily subscribe to the first part of paragraph 5, page 6; but we feel that the sentence—"To the extent that the uses

of water are competitive, the use of water for domestic, agricultural, and industrial purposes should have preference."—might be open to question. Considering the area as a whole, this statement is probably correct; but we could not subscribe to the thought that any particular plot or block of agricultural land, regardless of how submarginal it might be, should have prior use of water over an important muskrat marsh or other wildlife project. Likewise, every industrial use might not have so much value from, the national standpoint as the wildlife benefits.

As a whole, the report seems to be well prepared and gives fair consideration to diverse interests.

Sincerely yours,

ALBERT M. DAY,
Acting Director.

BOARD OF REVIEW'S REPORT TO THE COMMISSIONER

UNITED STATES DEPARTMENT OF THE INTERIOR,
BUREAU OF RECLAMATION,
Denver 2, Colorado, April 14, 1944.

From Board of Review.
To Commissioner.

Subject: Report on Conservation, Control, and Use of Water Resources of the Missouri River Basin.

1. Pursuant to instructions in your letter of February 2, 1944, the undersigned convened as a special board of review in Denver, Colo., April 10 to 13, 1944, to consider the report of April 1944 on the Conservation, Control, and Use of Water Resources of the Missouri River Basin, prepared by the Bureau of Reclamation staff of region 6, assisted by consultants, and representatives of

other Government agencies. The results of our review of the report are respectfully submitted herein.

2. The water of the Missouri River system is a primary national resource which, up to the present time, has been inadequately controlled and developed. The two major problems of the basin are the control of devastating floods along the lower river and the stabilization of agriculture in the Dakotas and in eastern Montana.

3. The river and its basin long have been studied by Federal, State, and other agencies, but until recently the studies have not been coordinated or sufficiently broad to comprehend and outline a unified plan for the conservation and beneficial uses of water so as to realize the greatest procurable economic returns and human benefits for the entire region. In our opinion, the report presents a plan which, if carried out, would adequately meet these objectives. It is a comprehensive plan for the highest beneficial use of the waters of the basin. It provides for flood control, navigation, irrigation, power development, domestic and industrial water supplies, silt control, recreational use of waters, conservation of fish and wildlife, and pollution abatement, and will assist in the restoration and maintenance of groundwater levels and inland lakes.

4. The report is the result of long and intensive engineering, scientific, and economic study. The plan is technically and economically sound. It is not proposed or expected that the program as a whole should be undertaken immediately or at one time, but it should progress by starting with the parts that are urgently needed and continue as rapidly as funds become available and economic conditions demand. The greatest benefits will be attained through coordination of the advice and work of all interested Federal, State, and local agencies.

5. To the extent that the several functions of water control and utilization are conflicting, preference should be given to those which make the greatest contribution

to the well-being of the people and to the areas of greatest need. To the extent that the uses of water are competitive, the use of water for domestic, agricultural, and industrial purposes should have preference. The plan would meet these objectives.

6. In determining the justification for this development and the subdivisional features thereof, the report recognizes and the Board confirms the principle that a project or a broad development is justified if the total value of all the benefits to be derived from it exceeds the total cost, whether or not all costs can be recovered from the direct beneficiaries. The report summarizes the benefits of the basin-wide project, and finds that they exceed the estimated costs in the ratio of 2.57 to 1. The Board concurs in this finding.

7. The agency with primary interest in the dominant function of any feature proposed in the plan should construct and operate that feature, giving full recognition, in the design, construction, and operation, to the needs of other agencies with minor interests. All reservoirs where flood control and navigation are dominant should be operated by the Corps of Engineers, and where the flood control and navigation functions are minor, the reservoirs should be operated in accordance with regulations of the Corps so far as flood control and navigation are concerned. All irrigation features should be operated by the Bureau of Reclamation or its agents. All reservoirs in which irrigation, restoration of surface and ground waters, or power, is dominant, should be operated by the Bureau of Reclamation. Where these functions are minor, the reservoirs should be operated under regulations of the Bureau of Reclamation so far as such functions are concerned. In like manner, agencies with jurisdiction over other functions should be recognized. The Bureau of Reclamation should construct and operate all power-transmission facilities, and should have the responsibility for the disposal of all power generated.

IRRIGATION

8. Land-use adjustments needed to stabilize the agriculture of the basin and mitigate the effects of future droughts can best be promoted by progressive development of the irrigation potentialities of the area. In addition, hundreds of thousands of new residents of the area can be provided opportunities to establish homes and to earn for themselves an adequate level of living. Many projects will be of prime importance in any program for the rehabilitation or settlement of returning servicemen and dislocated war workers. Irrigation water users should pay for the service rendered them an amount commensurate with the benefits they receive, and their payments should be based on ability to pay out of earnings of the irrigated land. Many of the project areas will be served with water by pumping. The power used in pumping will be provided from the seasonal output of installations proposed in the report. The power should be paid for as an integral part of operation and maintenance charges, and the resulting operation and maintenance charges should be equalized throughout the area by integrating them with repayment charges and the total to the ability of the land served to produce returns for the farmer.

POWER

9. The average unit costs of power and energy for the power developments described in the report will be such as to accomplish the repayment of the construction costs of power development within a reasonable period of years and, in addition, will permit substantial contributions from power revenues to assist in the repayment of other project features as well as providing low-cost power for irrigation pumping purposes.

10. The market studies indicate the ability of the basin and contiguous areas to absorb in a relatively few years the power to be developed. The large number of comparatively high-cost fuel-burning generating plants

now operating in the area offer exceptional possibilities for sale of a large quantity of hydroelectric power as fast as it can be developed. This situation exists because of the immediate opportunity to eliminate high fuel and other generating costs by energy replacement in some cases, and by complete retirement of obsolete plants in others. Growth of load will soon absorb the balance of the output.

11. The low-cost power to be developed should be given the widest possible distribution for the benefit of the whole region. This could be accomplished best by clothing the Bureau of Reclamation with the responsibility for its distribution and sale. Preference in sales should be given to public bodies and cooperatives.

FLOOD CONTROL

12. The main-stream reservoirs in South Dakota, together with the reservoirs on the tributaries in eastern Kansas and in Missouri and the levee system, will provide the protection needed by the fertile bottom lands and the important cities along the Missouri River below Yankton. They will also aid in the control of Mississippi River floods below St. Louis. The reclamation plan supplements such flood control by the addition of a number of multiple-purpose reservoirs on tributaries of the Smoky Hill River and on the headwaters of the Republican River.

13. On the headwaters of the Missouri River, and its western tributaries in the Dakotas, and on the headwaters of the Platte River, the reclamation plan provides necessary flood control in the areas most seriously menaced, in the main, through the operation of multiple-purpose reservoirs.

NAVIGATION

14. Navigation possibilities are limited to the Missouri River up to Sioux City. While the traffic on this stream

has never been impressive even below Kansas City, the Missouri River carries potentialities as an important waterway in the future as Kansas City, Omaha, Sioux City, and their tributary areas continue to grow. The utilization of the stream as a waterway should be planned, and such planning should be adapted to the flows to be expected with justified upstream development. The storage facilities contained in the reclamation plan provide the necessary stream regulation to insure a sustained and well-regulated flow through the years, regardless of the vagaries of precipitation.

SILT CONTROL

15. The control of silt is important in many localities. The most urgent silt problems are in the Big Horn River Basin, but the problem is also serious in the Yellowstone River and its other tributaries as well as in the western tributaries of the Missouri River in the Dakotas. The storage control provided throughout the Missouri River system above Yankton will desilt the streams and eliminate most of the silt problems in connection with operations of irrigation and municipal water systems. The retention of the silt by these means will reduce the cost of maintaining the channels in the navigation section of the Missouri River and the Mississippi River below St. Louis.

DOMESTIC, MUNICIPAL, AND INDUSTRIAL WATER SUPPLIES

16. In many parts of the basin, surface waters are relied upon for domestic and municipal water supplies. In the future there will also be greater requirement for industrial water supplies. Regulation of flows of many tributaries as proposed, and the diversion of water from the Missouri River into eastern North Dakota and the Red River Valley, and into the James River Valley in South Dakota, will benefit many cities, towns, and populous areas by increasing low-water flows and restoring ground-water levels.

17. Some communities that depend on wells are faced with the necessity of searching for new water sources because of lowering ground-water levels. The falling water tables have also dried up or reduced to stagnant pools many old lakes in the northern plains. The plan calls for the restoration of some of these lakes, and will also have a beneficial influence on water tables through percolation of water from canals, irrigated farms, and small stream channels.

FISH AND WILDLIFE

18. The Missouri River Basin has areas of outstanding importance in the conservation of fish and wildlife. Notable among them are mountain fishing streams, and the waterfowl refuges and breeding grounds in the northern plains. The development of the water resources of the basin will adversely affect some of the existing facilities, but it will also create exceptional opportunities for expanding the fish and wildlife programs. No unnecessary injury should be inflicted, and construction plans should include such safeguards as fish screens at canal and other intakes, hold-over conservation pools in reservoirs (for maintenance of proper water elevations and stream flows during spawning and nesting seasons whenever practicable), and other good conservation practices. Facilities destroyed or damaged should be replaced by others of equal utility as a part of the new construction in the conservation programs, wherever possible.

RECREATION

19. The basin includes parts of three great National Parks, Yellowstone, Glacier, and Rocky Mountain along the Continental Divide, numerous national forests, and many smaller recreational facilities ranging from fishing grounds in the mountains to historical sites on the plains; but there are large areas where recreational facilities are inadequate. The restoration of Devils Lake and the con-

struction of the numerous proposed reservoirs will provide recreational opportunities of major importance within these areas. These opportunities should be capitalized through stocking the lakes and reservoirs with fish, and providing facilities that will be needed to care for the public, such as campgrounds, boat landings, and shelters.

POLLUTION ABATEMENT

20. Along the Red River of the North, and in various other places within the basin, including some areas bordering the Missouri River itself, waters are polluted by discharge of untreated sewage into streams. In periods of low flow, pollution has become serious, threatening the safety of water supplies and creating nuisances. Diversion of water into the Sheyenne River and thence into the Red River of the North will abate some of these conditions. So far as possible, sufficient low-water flows should be maintained throughout the basin to prevent dangerous pollution; but this should not be considered as a substitute for the treatment of sewage where necessary to maintain proper sanitary conditions and the use of stream flows for dilution of sewage should be held to a minimum.

HYDROLOGY

21. Reliable stream-flow records covering sufficient time to reflect variations in flow are a prerequisite to sound project planning, to assure proper control and full utilization of the waters, and to avoid waste of construction funds on the one hand, and the hazards of water shortages, flood damages, and power shortages, on the other. No run-off records are available for many of the smaller streams, and on the larger streams the available records are often inadequate because of insufficient stations, particularly at critical locations. The present inadequate program of stream gaging being conducted by State and Federal agencies should be greatly expanded at once, to the end that the tentative project plans may

be confirmed or modified on the basis of more complete stream-flow records, before it becomes necessary to start construction. This situation is particularly applicable to the numerous small projects on the minor tributaries. The appropriations for the United States Geological Survey for stream-gaging work should be substantially increased, and the lack of available State appropriations for matching Federal funds should not be permitted to delay a program at least sufficient to provide the needed records at many key stations.

DESIGNS AND ESTIMATES

22. The project plan includes hundreds of major engineering works, such as dams and power plants, and thousands of important structures. The plans on which the estimates are based were necessarily of a preliminary nature. At many of the dam sites, exploratory work has been carried far enough to obtain dependable basic data. At other sites, further exploratory work must be undertaken before details of the structures can be determined and better estimates made. All the works proposed in the report are of the same general type which the Bureau of Reclamation has been constructing in the West since 1902, and no novel or unprecedented problem are involved. All cost estimates are tentative, and are subject to revisions in the light of further information which must be developed by exploratory work and detailed design studies before construction is undertaken. A lump-sum allowance has been included for contingencies for unforeseen conditions, but no allowance has been included for major economic changes. All estimates are based on costs as of January 1, 1940, and an appropriate factor will therefore have to be applied to conform such estimates to prices existing at the time the construction of any feature of the development is initiated.

INITIAL CONSTRUCTION PROGRAM

23. The following list of projects is submitted as the initial stage of an orderly program to effectuate a plan of development presented in the report. The list is confined to projects or project features which should, in the opinion of the Board, be constructed by the Bureau of Reclamation:

Colorado:

Transmountain diversion projects were not considered a part of this basin.

Kansas-Nebraska:

Bostwick.
Cedar Bluff.
Frenchman-Cambridge.
Kirwin.
North Republican (Wray) (Colorado-Nebraska).
Pumping.

Montana:

Canyon Ferry Reservoir.
Glasgow Bench Pumping.
Hardin (including Yellowtail Dam).
Marias.
Missouri-Souris (Montana division).
South Bench.
Yellowstone River Pumping units.

North Dakota:

Heart River.
Knife River.
Missouri-Souris (North Dakota division).
Missouri River pumping units (5).

South Dakota:

Angostura.
Grand River (Shadehill-Bluehorse).

Oahe (James River).
Rapid Valley (including Brennan Reservoir).

Wyoming:

Big Horn pumping units.
Big Horn Project (Boysen Dam).
Glendo Reservoir.
Kortes.
Owl Creek.
Paintrock.
Riverton.
Shoshone project extensions.

Power transmission lines.

RECOMMENDATIONS

It is recommended:

(*a*) That the general plan for the development of the basin as contained in the report be approved subject to such modifications and changes as may be indicated, from time to time, as the plan is effectuated.

(*b*) That all works that may be authorized under the approved plan be constructed, operated, and maintained by the Bureau of Reclamation under the direction of the Secretary of the Interior wherever the dominant function of such works is other than navigation and flood control.

(*c*) That the Bureau of Reclamation under the direction of the Secretary of the Interior make all arrangements for the sale and distribution of electric energy generated at all hydroelectric developments hereafter constructed by any Federal agency within the basin as defined in the report, and be authorized to construct, operate, maintain, and improve such electric transmission lines and substations as it finds necessary or desirable in connection therewith.

(*d*) That the initial construction program as hereinabove presented be adopted and that an appropriation of

$200,000,000 be authorized for the prosecution of construction work on the first stage of the program and for the continuation of investigations on the general plan of development.

E. B. DEBLER,
Chairman, Director of Branch of Project Planning.

S. O. HARPER,
Chief Engineer, Director of Branch of Design and Construction.

H. F. MCPHAIL,
Director of Branch of Power Utilization.

W. F. KUBACH,
Director of Branch of Fiscal and Administrative Management.

D. S. STUVER,
Assistant Director of Branch of Operation and Maintenance.

SUMMARY FOREWORD

Wheat, butter, meat, wool, leather, and many other valuable commodities used by the people of the United States come from a wide, sparsely populated area which lies between the highly developed Middle-West and Eastern States and the growing far West States, and extends from the Canadian border far down into Texas, almost separating the country into two distinct parts. This Great Plains area and the mountainous country which bounds it on the west yield not only foodstuffs and textile materials which are important to the prosperity of the country, but also certain valuable and strategic minerals, and a wealth of oil. Economically, it is a very important part of the Nation.

The cities and large towns, and much of the best agricultural land in the Great Plains area lie in the flood-

plains of the rivers, and occasionally, like some eastern cities and farm lands, they suffer great damage from floods. The greater part of the area experiences serious variations in rainfall, and corresponding fluctuations in crop yields. Occasionally, it suffers long periods of drought, during which losses far exceed those due to floods. The effects of such disasters are not confined to the Great Plains; they extend to the whole country, because they disturb commerce in the hundreds of millions of dollars' worth of materials and articles which are exchanged annually between residents of the Great Plains States and residents of other States. On some occasions, enormously expensive relief and rehabilitation programs have been necessary after floods or droughts because, in the interest of national prosperity and security, the area cannot be abandoned, nor allowed to lose the fruits of developments by private initiative that are, or can be made to be, economically sound.

Man cannot exercise control over the weather—the fundamental cause of droughts and floods; but by devices known to engineers, he can modfiy floods and their effects, and by practices known to engineers and agricultural scientists he can alter the farming facilities and the farm and ranch practices in some localities so as to diminish both the direct and the indirect effects of droughts. For years, the Corps of Engineers, United States Army, has been engaged in designing and constructing river improvements for the purposes of reducing flood damages and aiding navigation; the Bureau of Reclamation has been putting water on arid land and finding supplemental water for distressed irrigation farmers; and the Department of Agriculture, the State colleges, the State experiment stations, and the county agricultural agents have been laboring to improve agricultural facilities and practices. In order to perform efficiently and to handle large-scale projects, these and other government and local agencies must cooperate closely, and in accord with broad plans, each plan being

inclusive of all resources, problems, and possibilities that are properly related in one unit. So far as the cooperative activities of the Corps of Engineers and the Bureau of Reclamation are concerned, a river basin is a suitable unit on which to base plans.

This report deals with a plan for the conservation and control of the water resources of the entire Missouri River Basin, which includes the northern Great Plains, and the use of such resources in watershed development. Every water resource and all feasible beneficial uses of water, such as aids to navigation, flood control, the irrigation of land, the producing of power, the restoration of surface and ground-water levels and of domestic and municipal water supplies, the abatement of stream pollution, silt control, fish and wildlife preservation, and recreation, were taken into account in an effort to formulate a basin-wide plan most likely to yield the greatest good to the greatest number of people. The plan is based on specific information with respect to the character and needs of different sections of the basin, and on experience in designing, building, and operating works of the kinds that will be required in the Missouri River Basin. It is adapted to development in stages, and to such modifications as changes in physical and economic conditions make necessary. Agriculture is and always will be the primary basis of the economy of the Missouri River Basin. On agriculture, other economic activities in the basin largely depend. This fact has been recognized in designing a plan for water-resource development for the basin.

Plans of the Corps of Engineers cover channel improvements from Sioux City to the mouth of the river and a number of reservoirs on the upper river, mainly for flood control and aid to navigation. Such existing and proposed developments are referred to or are described in House Document 475, Seventy-eighth Congress, second session, and in the documents referred to therein.

The plan here tendered incorporates the Corps of Engineers' proposed plans for flood control and aids to navigation in the river below Sioux City, with some modifications of Army plans for developments on the upper river, for the reason that certain reservoirs and related works further up in the river basin would facilitate navigation and flood control on the lower river, and, at the same time, serve other purposes.

This basin-wide plan provides for a number of reservoirs on the upper reaches of the Missouri River and its tributaries, for the purposes of storing water, and releasing it during periods of low flow. Such reservoirs will contribute to flood control not only on the lower river but at all points from the mouth of the river to the reservoir sites; they will aid navigation on the lower river by reducing flood damages to navigation works and by increasing the dry-season flow; they will enlarge the supply of water available for irrigation; and they will make practicable the generation of electrical energy at many places.

The irrigation of land in the basin, generally in relatively small blocks along the streams, will add to an unavoidably precarious dry farming and grazing economy a dependable type of agriculture which will have a stabilizing effect on whole communities; it will supplement the ranges in supporting a larger, better, and less hazardous livestock industry; and by increasing the population and the farm yield and income, it will reduce the per capita costs of government and raise standards of living and of citizenship. In periods of severe and long-continued drought, such as have occurred at long intervals, and may occur again, forage raised on irrigated land will support foundation breeding stock, at least, and so speed recovery from drought damages.

The storing of water and the regulating of stream flow for purposes of irrigation will contribute not only benefits to downstream navigation and flood control, but frequently, facilities for the production of power, one of the

chief sources of wealth and well-being. Electrical energy developed at dams and canal drops will be used to pump water to land above gravity canals; and surplus power will be sold for domestic, municipal, and industrial applications.

The distribution of irrigation water in canals and the maintenance of year-round flows in some streams that ordinarily go dry in summer will relieve water shortages, and improve ground-water supplies. Return flow from irrigated land, and water diverted for the specific purposes will raise or restore ground-water levels in some areas, and abate stream pollution.

Both the creation of reservoirs and the regulation and maintenance of stream flow will aid in fish and wildlife conservation.

Present and future plans of State agencies and of various Government agencies, such as the Indian Service, the Fish and Wildlife Service, the National Park Service, and the Bureau of Reclamation, as well as the War Department, the Department of Agriculture, and the Federal Power Commission should be coordinated, in order to avoid the waste incident to conflicting plans and duplication of effort, and in order to gain the advantages of large-scale, coherent works and operations.

Comparison of estimated costs with repayments and returns computed pursuant to existing legal requirements, and supportable on the experience of operating Federal projects for like purposes, justifies the conclusion that the value of the benefits to be derived from the recommended program will exceed the cost of the project, and warrant the recommendation that the construction of the project as planned be approved.

A general statement with respect to the Missouri River Basin and its economic problems, and a comprehensive plan for developing and utilizing its water resources is contained in this report. Supporting data are to be found in the reports and files of the Bureau of Reclamation and the Corps of Engineers.

* * *

MISSOURI RIVER PROJECT PLAN

SUMMARY OF COSTS, BENEFITS, AND RETURNS

FOREWORD

Nobody can prevent the sudden downpours nor the quick thaws that produce floods, nor avert drought, nor make rain fall at will. Man can mitigate the evils of flood and drought by intelligent management of his resources and by engineering works, and he can bring together artificially, water and land to make them yield food and shelter for him. Here are summarized, briefly, the benefits to be derived from the intelligent, coordinated development and use of the water resources of the Missouri River Basin.

The welfare of the residents of an area 1,300 miles long and 700 miles wide, extending from St. Louis, Mo., in the southeast, to Cut Bank, Mont., in the northwest, and from Denver, in the southwest, to Devils Lake, N. Dak., in the northeast, is influenced by the waters of the Missouri River and its tributaries. People living along the lower river want protection from floods at one season, and supplemental water for navigation at another. Residents of the western and northwestern sections of the Missouri River Basin want protection from local floods, water for irrigation, and power for various purposes. Some areas need water for domestic and sanitary uses.

Man cannot prevent the sudden downpours nor the quick thaws that produce floods; he can only distribute floodwaters in time and place, and so reduce their destructive powers. He cannot prevent drought nor make rain fall at will; he can only store water for use in dry seasons, and thus escape its worse effects. The plan proposed here recognizes these facts, and, also, the fact that, in order to make the waters of the Missouri Basin serve the greatest number of people to the greatest advantage, those waters must be conserved and used according to a

coordinated plan which must recognize all beneficial uses of waters, weigh their relative values, and make a compromise, from a basin-wide viewpoint, in each instance of conflict.

This plan proposes that a large number of reservoirs be created on tributaries of the Missouri River, in Colorado, Wyoming, Montana, North Dakota, South Dakota, Nebraska, Kansas, and Missouri, and that a small number of important reservoirs be built on the main stem of the river. All these reservoirs will serve one fundamental purpose, namely, that of impounding water in periods of heavy run-off from the land, and releasing it during periods of low stream flow.

In all cases, by impounding flood water, the reservoir will have beneficial effects in reducing flood hazards everywhere downstream. Water released from the reservoirs may serve one or several of many purposes. In the greater part of the basin, which is one of the important agricultural provinces of the United States, water is needed for irrigation, which will contribute to the further development of the Nation's resources, and will offset to some extent the disturbing effects of wide variations in rainfall. More than a hundred proposed irrigation projects, scattered through seven States, will in time add more than 4,000,000 acres of land to the stable farm resources of the country.

At many of the reservoirs, power plants will be built for the purpose of converting to electricity the energy available from the falling of water released. A network of transmission lines will connect the power plants with each other, with other power systems, and with power consumers' facilities. Much of the power will be used in pumping water for irrigation, but much more of it will be available for domestic, municipal, commercial, and industrial uses. Practically none of the power users will consume energy at a uniform rate throughout the year. Few, if any, of the power plants will be capable of gen-

erating at their maximum capacities throughout the year. Not all of the peaks of demand occur simultaneously, nor do all the periods of high productive capacity at the power plants. The transmission system will serve the double purpose of delivering power from a pool to the combined loads of consumers, and of shifting loads from plant to plant, in order to take advantage of their periods of high productive capacity.

The population and prosperity of this region cannot be expected to expand without further irrigation development, made and operated at costs within the ability of the irrigators to pay. In the plan proposed, irrigation pumping with its incidental power requirements plays a large part. The cost of such power will be an important element in the irrigators' annual expenses, and must be low if success is to be achieved. Experience and study indicate that the cost per kilowatt-hour should not exceed 2½ mills for energy delivered to major project pumping plants.

The capacities of the proposed reservoirs have been determined by two or more requirements—the impounding of flood waters as a means of reducing flood damages; the storing of water for the purpose of irrigating land, generating power, or supplying water for domestic, sanitary, or recreational and wildlife purposes; the storing of water to be released during the navigation season of the lower river; or the entrapping of silt. The releasing of water from the upstream reservoirs will be governed generally by the requirements of irrigation and power generation, and from the lower reservoirs by navigation needs.

Of the water that falls as rain or snow, much is lost by evaporation from land and from the surfaces of lakes and streams, and even more is consumed in plant growth; the remainder runs away to the sea. The building of reservoirs and the irrigating of land will increase evaporation losses, but the water so lost will be stored floodwater, or

will be replaced by stored floodwater. Water diverted from the Missouri River Basin for use in the northern and eastern parts of North Dakota will also reduce the annual run-off of the Missouri River, but it, too, will be taken from floodwaters, by means of reservoirs. Despite these losses and diversions, sufficient run-off and flow will remain when regulated by the proposed reservoirs to provide supplemental water for navigation on the lower river during normal low-water seasons.

Some areas drained by tributaries of the lower river, subject to flash floods, will be benefited little, if at all, by upstream conservancy works. They must depend for relief on local stream improvements.

Such a multiplicity of factors and such a mass of technical detail have necessarily entered into this study that it is entirely impracticable to place in one volume the data gathered in support of the findings as finally revealed in the proposed plan. Summing up, provisions are made for the irrigation of 4,760,400 acres of land not now irrigated, and a supplementary water supply will be furnished to 547,300 acres of land now having an inadequate water supply, thus benefiting a total of 5,307,700 acres. Proposed irrigation development is scattered throughout the drier portions of the basin, as follows:

[Table Omitted in Printing]

Some land and improvements in river bottoms will be flooded, but, with few exceptions, reservoirs will cover lands of little or no agricultural value. The area flooded is insignificant compared with the area to be benefited. Eliminating the Army's proposed Garrison Reservoir will preserve many improvements and will also preserve 50,000 acres of land, much of which will be irrigated. Indian land, public lands, and private lands and property have all been given the same consideration. Ample allowances have been made in cost estimates for the replacement of all improvements that will be destroyed.

Complementing irrigation development, the construction of 17 power plants is proposed, with an aggregate installed capacity of 758,500 kilowatts. These plants will be capable of generating 3,809,200,000 kilowatt-hours of firm energy annually. A transmission grid system is included in the plant to interconnect generating and pumping plants and to permit the delivery of power to all existing distribution centers, and to others on the fringe of the basin, within the probable market areas. These power plants are likewise distributed throughout the basin, as follows:

[Table Omitted in Printing]

Flood protection is afforded to all areas subject to inundation, throughout the length of the river, and on most of the main tributaries where the flood problem is acute. All of the reservoirs included in the plan afford some degree of flood protection inasmuch as they conserve floodwaters for use later, in irrigation or for navigation purposes. The plan includes the flood-control reservoirs proposed by the Corps of Engineers, as presented in House Document 475, 78th Congress, second session, or suitable substitute, and, in addition, many others not included in the Army plan. Excluding the reservoirs on tributaries of the lower Missouri, in the State of Missouri, the proposed capacity of which are not stated in House Document 475, 78th Congress, second session, a total of 89 reservoirs are included in the proposed basin-wide plan, with a combined capacity of 45,700,000 acre-feet, which is more than the average annual flow of the Missouri River at its mouth. Reservoirs have been so located as to desilt those streams in which the silt load is heavy, particularly the Big Horn, Powder, Republican, Smoky Hill, and that portion of the main stream from the mouth of the Yellowstone River to Kansas City.

An assured minimum and practically uniform flow in the main river from Sioux City to the mouth, for navigation purposes, will maintain navigability of that stream with much lower annual dredging costs than have heretofore been anticipated.

Minimum flows in all streams of the basin where sanitation conditions have often been impaired will be amplified to alleviate past dangers.

The numerous reservoirs to be built will increase recreation possibilities throughout the entire basin, in many places where such possibilities have been nonexistent before, and will also increase fish life. The restoration of Devils Lake will reestablish that community in its former place of importance as a tourist center. While some of the important wildlife refuges now in operation will be obliterated, many opportunities will be afforded for the substitution of equally good refuges, and the total number can be greatly increased. In cost estimates, adequate provisions have been made for replacing fish and wildlife facilities that will be destroyed or impaired.

BENEFITS

IRRIGATION

The benefits from the stabilization of agriculture in areas adjacent to the proposed irrigation units are not susceptible of evaluation. The direct benefits from irrigation are usually measured in terms of increases in gross crop values to be expected. Based upon the 1930-41 average of crop values on operating Bureau projects in the basin, after comparing soil and climatic conditions with those on existing projects, and separately determining the expected crop values for each of the 150 or more units in the plan, the estimated increase in crop values is expected to average $130,000,000 per year, exclusive of livestock. The irrigation of 4,760,400 acres of new land and the furnishing of supplemental waters to 547,000 additional acres, will furnish a stabilized diversified agricultural opportunity on 53,000 farms averaging 90 acres each. With an average of 4 persons per farm, rural population will be increased by 212,000. Statistics show that for every person on the farm at least 2 additional persons

can find a means of livelihood in adjacent towns and cities, thus making a prospective increase in total population of 636,000 in the Missouri Basin from irrigation development alone. The past 20-year trend of declining population will be reversed, the deficiencies will be overcome, and the final increases will resemble the 1900-20 trend.

The average assessed valuation per capita in the basin, exclusive of the more populous southeastern section, approximates $1,000. Increased valuation of more than $600,000,000 may thus be anticipated. This broadening of the tax base in the basin is a major justification for the project.

Evaluation of the probable feasible water-service charges on each individual unit in the plan shows that a total of $298,000,000 will be repaid to the Federal Government by irrigators within the 40-year period specified by Reclamation law.

POWER

Power market studies throughout the basin have shown that markets will be available as fast as firm power is produced, assuming that a reasonable length of time is required to place all of the plants in operation. Net revenues from the sale of power are estimated to be large enough to repay the cost of all power features with interest at 3 percent, and provide a substantial surplus applicable to other project costs. The power will have a value of $17,141,000 annually at full development, and that has been taken as a measure of its annual benefit.

FLOOD CONTROL

The report of the Army engineers on flood control of the Missouri River from Sioux City to the mouth proposes the construction of works costing a total of $661,000,000, the major features of which are incorporated in the plan herein proposed. In passing upon the Army plan, the Board of Engineers for Rivers and Harbors makes the following statement, justifying such an expenditure:

After thorough consideration, the Board concludes that the United States will profit by undertaking the improvements as recommended by the Division engineer, on a step by step basis.

Final evaluation of the flood-control benefits has not been made, but from available evidence it is reasonable to conclude that flood-control benefits are at least equal to the cost of the works providing such flood control as proposed by the Corps of Engineers. That figure is adopted as a measure of flood-control benefits, neglecting additional benefits derived from the Reclamation plan.

NAVIGATION

The benefits to navigation, by providing uniform flows in the lower river, do not lend themselves to close evaluation. Operation studies of reservoirs in this plan have shown that much of the storage capacity to be provided in proposed reservoirs is required for the control of high flows, and the subsequent release of stored water at uniform rates, to provide a steadily maintained flow for navigation. Allocations of costs in some of the reservoirs have been made to navigation, for this reason. The reservoirs in the lower Missouri will be of much benefit to navigation in the Mississippi, particularly at the Chain of Rocks, where much difficulty has been experienced in the past in providing sufficient depth for navigation. The aggregate benefits for navigation have been set at $166,600,000.

MUNICIPAL WATER SUPPLIES

Diversion of Missouri River waters into the James and Sheyenne Rivers in North Dakota and South Dakota will furnish municipal supplies to many towns and cities in those basins which have experienced extreme difficulty in obtaining sufficient water for their needs during the past decade. More than 19 cities and towns will thus obtain adequate and safe water supplies. Estimating the value of water to be furnished them at the rate of 10 cents per thousand gallons, total benefits for these purposes are

estimated at $20,000,000. No valuation is placed upon the water which will be supplied for the dilution of sewage and industrial wastes now poured into the streams and rivers without treatment. The value of such water is no doubt large, but no satisfactory basis has been found for its evaluation. Likewise no monetary value is placed upon restoration of ground water reserves or the creation of new recreational possibilities.

Benefits evaluated above are summed up as follows:

Summary of benefits

	Annual
Irrigation	$130,000,000
Power	17,141,000
Flood control	16,500,000
Navigation	4,165,000
Municipal water	500,000
Total	168,306,000

Annual costs

Operation, maintenance, repairs, and replacements:	
Irrigation	$7,725,000
Power	4,316,000
Flood control and navigation	4,500,000
Amortization of entire cost of project at 3 percent in 50 years	48,872,000
Total annual cost	65,413,000
Ratio of annual costs to annual benefits	1:2.57

Repayments and returns

Total estimated cost	$1,257,645,700
Allocation to—	
Flood control	419,300,700
Navigation	97,245,000
Subtotal	516,545,700
Balance repayable	741,100,000
Repayments from—	
Irrigation (40 annual payments)	298,000,000
Power (50 annual payments)[1]	423,100,000
Municipal (40 annual payments)	20,000,000
Total	741,100,000

[1] In addition to the repayments indicated, power revenues will also be sufficient to collect the interest charges on the costs allocated to power.

* * *

The need for large reservoirs on the main stream.—The Missouri-Souris unit, by diversions to its Northern Division through the Missouri Canal, pumping from the Fort Peck Reservoir to the Glasgow Bench division, and pumping from the main stream below Fort Peck, will use for irrigation practically all of the run-off of the Missouri River Basin above Fort Peck. The reauthorization of the Fort Peck Dam on May 18, 1938, was for the purpose of improving navigation on the Missouri River and for other purposes incidental thereto, including power. The plan herein presented makes irrigation a primary use of water, and substitutes other storage downstream for the Fort Peck Reservoir, to serve navigation and other purposes.

Water supply studies indicate that additional reservoirs on the river in South Dakota will be necessary for navigation, flood control, irrigation, and other uses. In 1943, a record-breaking flood occurred as a result of snow melting rapidly on frozen ground in the Missouri watershed in North Dakota. This flood dramatized the need for flood control on the Missouri River in the Dakotas. It was followed a month or two later by additional floods in the lower river, which originated below Kansas City. These events confirmed the opinion that large reservoirs are necessary on the Missouri, and to meet the requirements the construction of three dams is proposed.

The Oahe unit.—The most favorable location for a large reservoir on the main Missouri in South Dakota is about 8 miles north of the city of Pierre, the capital. The proposed Oahe Dam, 192 feet high, with a crest length of 7,000 feet, will create a reservoir of 19,600,000 acre-foot capacity, and will back the water up the Missouri River to the city of Bismarck, N. Dak. The reservoir will serve many purposes, the principal of which are the irrigation of a large tract of land in the James River Basin, regulation of Missouri River flows for navigation purposes, power production, and flood control. It lies below the Yellowstone River, the largest of all Missouri

River tributaries, contributing more water than the Upper Missouri River, itself.

Water in the Oahe Reservoir will be maintained at such an elevation that a pumping plant on the left bank, by lifting water an average distance of 110 feet, to a canal approximately 125 miles long, can serve the Oahe unit lands, an irrigable area of 750,000 acres in the James River Valley. Near the end of this main canal, the water pumped at Oahe will be dropped 241 feet, and will develop sufficient power to offset that required for lifting it out of the Missouri River. The drop and power plant will be about 35 miles west of the city of Huron. At the tail-race of the power plant, water will be divided, a larger portion of it flowing northward in a long canal to the vicinity of Aberdeen, and the remaining part of it flowing southeastward to the city of Mitchell. The area to be irrigated lies west of the James River, in a strip about 20 miles wide and about 80 miles long.

Water stored in the Oahe Reservoir will be available for navigation purposes on the lower river, as a substitute for water taken from the Fort Peck Reservoir for irrigation and other purposes. Ample storage capacity for floodwaters will be provided, to reduce downstream flows to the safe capacity of the river channel from Sioux City to Kansas City. The reservoir will also have spare capacity to store the anticipated silt load of the river for an indefinite period after upstream reservoirs are completed. In conjunction with additional reservoirs below Oahe, sufficient power can be produced to justify an installed capacity of 150,000 kilowatts at Oahe.

* * *

APPENDIX C

78th Congress
2d Session

SENATE

Document
No. 247

MISSOURI RIVER BASIN

REPORT

OF A

COMMITTEE OF TWO REPRESENTATIVES EACH FROM THE CORPS OF ENGINEERS, U.S. ARMY, AND BUREAU OF RECLAMATION, APPOINTED TO REVIEW THE FEATURES OF THE PLANS PRESENTED BY THE CORPS OF ENGINEERS (HOUSE DOCUMENT NO. 475) AND THE BUREAU OF RECLAMATION (SENATE DOCUMENT NO. 191) FOR THE COMPREHENSIVE DEVELOPMENT OF THE MISSOURI RIVER BASIN

Supplemental to Senate Document No. 191 and
House Document No. 475, 78th Congress

[LOGO]

PRESENTED BY MR. O'MAHONEY
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MISSOURI RIVER BASIN

OCTOBER 25, 1944.

To the SECRETARY OF WAR and the SECRETARY OF THE INTERIOR:

1. In view of the questions raised regarding the differences between the separate plans presented by the Corps of Engineers (H. Doc. 475, 78th Cong., 2d sess.) and the Bureau of Reclamation (S. Doc. 191, 78th Cong., 2d sess.) for the comprehensive development of the Missouri River Basin, a committee, composed of two representatives each from the Corps of Engineers and the Bureau of Reclamation, was appointed to review the engineering features of the two plans with a view of reconciliation between them.

2. The committee met at Omaha, Nebr., on October 16 and 17, 1944, discussed the various features of both plans, examined the supporting data for each plan, and prepared the enclosed joint engineering report. The joint engineering report points out that by making appropriate modifications it is possible to eliminate existing differences between the two plans.

3. It was possible to bring into agreement the plans of the Corps of Engineers and the Bureau of Reclamation by recognizing the following basic principles:

(*a*) The Corps of Engineers should have the responsibility for determining main stem reservoir capacities and capacities of tributary reservoirs for flood control and navigation.

(*b*) The Bureau of Reclamation should have the responsibility for determining the reservoir capacities on the main stem and tributaries of the Missouri River for irrigation, the probable extent of future irrigation, and the amount of stream depletion due to irrigation development.

(*c*) Both agencies recognize the importance of the fullest development of the potential hydroelectric power in the basin consistent with the other beneficial uses of water.

4. For convenience in referring to the joint engineering report the following comparable six subdivisions contained in the report of the Bureau of Reclamation, Senate Document 191, Seventy-eighth Congress, second session, have been used.

(*a*) Upper Missouri River Basin.

(*b*) Yellowstone River Basin.

(*c*) Missouri River—Fort Peck to Sioux City.

(*d*) Minor western tributaries.

(*e*) Niobrara, Platte, and Kansas Rivers.

(*f*) Lower Missouri Basin.

UPPER MISSOURI RIVER BASIN

5. The plan presented in House Document 475, Seventy-eighth Congress, second session, does not specifically designate any units in the upper Missouri River Basin subdivision, although provisions are made for desirable and necessary projects in this area. The plan presented in Senate Document 191, Seventy-eighth Congress, second session, contemplates the construction of 19 reservoirs with a total storage capacity of 3,359,950 acre-feet for flood control, silt control, the development of hydroelectric power, the irrigation of 460,900 acres of new lands, and the provision of a supplemental water supply for 208,700 acres of land now being served with an inadequate water supply. There is no conflict in the proposed plans of the two agencies for the upper Missouri River Basin subdivision.

YELLOWSTONE RIVER BASIN

6. The plan presented in House Document 475, Seventy-eighth Congress, second session, provides for the construc-

tion of Boysen Reservoir with a storage capacity of 3,500,000 acre-feet and the Lower Canyon Reservoir with a capacity of 2,250,000 acre-feet to be operated for flood control, irrigation, navigation, power, and other purposes. The plan presented in Senate Document 191, Seventy-eighth Congress, second session, provides for the construction of 27 reservoirs located on various streams in the Yellowstone River subdivision with a total storage capacity of 4,285,200 acre-feet; the reservoirs to be operated for flood control, silt control, the development of hydroelectric power, the irrigation of 509,560 acres of new lands, and the provision of a supplemental water supply for 204,500 acres of land now being served with an inadequate water supply. It was concluded that the plan described in Senate Document 191, Seventy-eighth Congress, second session, would be adequate to accomplish the objectives of the plan described in House Document 475, Seventy-eighth Congress, second session.

MISSOURI RIVER—FORT PECK TO SIOUX CITY

7. The plan presented in House Document 475, Seventy-eighth Congress, second session, contemplates the construction of five additional multiple-purpose reservoirs on the main stem of the Missouri River for flood control, navigation, irrigation, power, domestic and sanitary purposes, wildlife, and recreation, as shown in the following table:

Project	Location	Approximate gross storage capacity (acre-feet)
Garrison	Near Garrison, N. Dak.	17,000,000
Oak Creek	Near Mobridge, S. Dak.	6,000,000
Oahe	Near Pierre, S. Dak.	6,000,000
Fort Randall	Near Wheeler, S. Dak.	6,000,000
Gavins Point	Near Yankton, S. Dak.	200,000

The plan also provides that as soon as substitute storage is built on the main stem of the river, the Fort Peck

Reservoir will be operated as a multiple-purpose reservoir primarily in the interest of irrigation.

8. The plan presented in Senate Document 191, Seventy-eighth Congress, second session, contemplates the use of Fort Peck Reservoir primarily for irrigation purposes, also for navigation, flood control, silt control, and power, and the construction of main stem reservoirs to be operated for flood control, irrigation, navigation, power, silt control, and other purposes, as follows:

Project	Location	Approximate gross storage capacity (acre-feet)
Oahe	Near Pierre, S. Dak.	19,000,000
Fort Randall	Near Wheeler, S. Dak.	5,100,000
Big Bend	Near Joe Creek, S. Dak.	250,000

Senate Document 191, Seventy-eighth Congress, second session, also includes four inland reservoirs to assist in regulating the water diverted from the main stem and the irrigation of 2,292,900 acres of new lands in the Missouri River—Fort Peck to Sioux City subdivision.

9. After full discussion of the various features of the two plans in this subdivision the following main-stem reservoirs were recommended in the joint engineering report in order to more fully utilize the water resources of the basin and to most effectively serve the present and ultimate requirements of flood control, irrigation, navigation, hydroelectric power, and other uses.

Project	Location	Approximate gross storage capacity (acre-feet)
Garrison	Near Garrison, N. Dak.	17,000,000
Oahe	Near Pierre, S. Dak.	19,000,000
Fort Randall	Near Wheeler, S. Dak.	5,100,000
Big Bend	Near Joe Creek, S. Dak.	250,000
Gavins Point	Near Yankton, S. Dak.	200,000

The final storage capacities to be selected for the above reservoirs will be jointly agreed upon after more detailed plans and cost estimates have been made.

10. The Garrison Dam, Reservoir, and power plant was included in the coordinated plan as it provides a large volume of useful storage capacity for flood control, navigation, and irrigation, and permits the utilization of approximately 160 feet of head for the development of hydroelectric power in an area capable of absorbing the potential output and which, otherwise has no prospective source of abundant low-cost power. A large reservoir at the Garrison site, situated immediately below the Yellowstone River with its large silt contribution, will prolong materially the life of downstream reservoirs.

11. The selection of the high Oahe Dam, Reservoir, and power plant as proposed in Senate Document 191, Seventy-eighth Congress, second session, floods out the Oak Creek Dam, Reservoir, and power plant as proposed in House Document 475, Seventy-eighth Congress, second session. The high Oahe Dam is required in connection with the irrigation of 750,000 acres of land in the James River Basin as well as to provide useful storage for flood control, navigation, the development of hydroelectric power, and other purposes. If the Oahe Reservoir is constructed to the elevation proposed in Senate Document 191, Seventy-eighth Congress, second session, a greater storage capacity will be provided than contemplated in the low Oahe and Oak Creek Reservoirs at considerably less cost.

12. The Fort Randall Dam in House Document 475, Seventy-eighth Congress, second session, and Senate Document 191, Seventy-eighth Congress, second session, utilizes the same site. However, House Document 475 contemplates a normal pool level at 1,375 mean sea level whereas Senate Document 191 contemplates a pool level at 1,365 mean sea level, in order to not interfere with the Big Bend power plant located near the upper limits of the reservoir. The Big Bend project is considered highly de-

sirable in the ultimate development inasmuch as approximately 60 feet of head is thereby made available for the development of hydroelectric power. The use of the Garrison, high Oahe, Big Bend, Fort Randall, and Gavins Point Dams and Reservoirs as outlined above and agreed upon in the joint engineering report will provide the desired degree of flood control, supply the needs of irrigation as well as furnish cyclic storage for navigation during prolonged drought periods. The plan also utilizes practically all of the available power head in the Missouri River between the mouth of the Yellowstone River and the Gavins Point Dam.

MINOR WESTERN TRIBUTARIES

13. The plan of development presented in House Document 475, Seventy-eighth Congress, second session, does not specifically designate any units in the minor western tributaries subdivision, although provisions are made for desirable and necessary projects in this area. The plan presented in Senate Document 191, Seventy-eighth Congress, second session, provides for the construction of 15 reservoirs with a total storage capacity of 1,237,000 acre-feet, the reservoirs to be operated for flood control, silt control, the development of hydroelectric power, the irrigation of 212,980 acres of new lands, and the provision of a supplemental water supply for 11,300 acres of land now being served with an inadequate water supply. There is no conflict in the proposed plans of the two agencies for the minor western tributaries subdivision.

NIOBRARA, PLATTE, AND KANSAS RIVERS

14. The plan of development presented in House Document 475, Seventy-eighth Congress, second session, contemplates the construction of 9 reservoirs (of which 4 have been previously authorized) for flood control, irrigation, and other purposes. The lands to be irrigated were not specified in the report and were to be determined by

later detailed investigation. The plan presented in Senate Document 191, Seventy-eighth Congress, second session, contemplates the construction of 22 reservoirs on various streams in the Niobrara, Platte, and Kansas Rivers subdivision with a total storage capacity of 5,650,400 acre-feet; the reservoirs to be operated for flood control, silt control, the irrigation of 1,284,060 acres of new land, and the provision of a supplemental water supply to 21,804 acres of land now being served with an inadequate water supply. The following substitutions were found to be desirable in the Kansas River Basin:

(*a*) On the south fork of the Republican River, the Bonny Reservoir, in Senate Document 191, was substituted for the Hale Reservoir in House Document 475 to permit the irrigation of approximately 6,500 acres of additional lands. The two reservoir sites are located within 4 miles of each other and for all practicable purposes would provide a comparable degree of flood control.

(*b*) On the Arikoree River the Pioneer Reservoir, in Senate Document 191, was substituted for the Beecher Island Reservoir in House Document 475 inasmuch as the Pioneer Reservoir controlled a larger drainage area, therefore was more advantageous for flood control, and reconnaissance studies by the Bureau of Reclamation indicated that there were no lands suitable for irrigation between the two sites.

(*c*) On Frenchman Creek the Enders Reservoir in House Document 475, was substituted for the Harvey Reservoir in Senate Document 191, because the Enders Reservoir could be built to a greater capacity than the Harvey Reservoir, and would furnish additional flood protection for the Frenchman Creek Valley in Nebraska. Both sites are suitably located to serve all potential irrigation developments.

LOWER MISSOURI BASIN

15. The plan of development as presented in House Document 475 and Senate Document 191 for this sub-

division are identical, therefore no conflict in the engineering features of the two plans exist. The plans include seven reservoirs and a series of levees and appurtenant works along both sides of the Missouri River from the vicinity of Sioux City, Iowa, to the vicinity of the mouth of the Missouri River.

16. Development of the Missouri River Basin in accordance with House Document 475, Seventy-eighth Congress, second session, and Senate Document 191, Seventy-eighth Congress, second session, as coordinated in the enclosed joint engineering report, if authorized as a unified plan, will secure the maximum benefits for flood control, irrigation, navigation, power, domestic and sanitary purposes, wildlife, and recreation. Precise elevations and heights of reservoirs and dams, and final determinations of the power installations required, can be agreed upon after more detailed plans and cost estimates have been obtained and compared with benefits, and after consideration has been given to the desires and objections of persons affected by the proposed developments.

HARRY W. BASHORE,
Commissioner,
Bureau of Reclamation,
Department of the Interior.

E. REYBOLD,
Major General,
Chief of Engineers, United States Army,
War Department.

WAR DEPARTMENT,
OFFICE OF THE DIVISION ENGINEER,
MISSOURI RIVER DIVISION,
Omaha, Nebr., October 17, 1944.

Subject: Joint report of representatives of Bureau of Reclamation and Corps of Engineers on plans for development of the Missouri River Basin.

To: The Chief of Engineers, United States Army, Washington, D.C., and the Commissioner, Bureau of Reclamation, Department of the Interior, Washington, D.C.

1. In accordance with instructions contained in letter of October 10, 1944, from the Commissioner of Reclamation to Mr. W. G. Sloan, assistant regional director, Bureau of Reclamation, Billings, Mont., and Mr. John Riter, acting director, Branch of Project Planning, Bureau of Reclamation, Denver, Colo., and letter of same date from the Chief of Engineers to the division engineer, Missouri River division, a conference was held in Omaha, Nebr., on October 16-17, 1944, as a result of which the following joint report is submitted.

2. For purposes of discussion, the basin was divided into the following six subdivisions contained in the report of the Bureau of Reclamation, Senate Document No. 191, Seventy-eighth Congress, second session:

(*a*) Upper Missouri River Basin.

(*b*) Yellowstone River Basin.

(*c*) Missouri River—Fort Peck to Sioux City.

(*d*) Minor western tributaries.

(*e*) Niobrara, Platte, and Kansas Rivers.

(*f*) Lower Missouri Basin.

3. It was agreed that there were no points of conflict in the engineering features of the two plans in the following subdivisions:

(*a*) Upper Missouri River Basin.

(*b*) Minor western tributaries.

(*c*) Lower Missouri Basin.

4. It was agreed that the Yellowstone River Basin be developed in accordance with the plans set forth in Senate Document No. 191, Seventy-eighth Congress, second session. With regard to the other two subdivisions all of the engineering features of both plans were agreed upon with the following modifications:

(*a*) Missouri River: Fort Peck to Sioux City.

(1) The Gavins Point Reservoir and the Garrison Reservoir to be developed in accordance with House Document No. 475 Seventy-eighth Congress, second session.

(2) The Fort Randall Reservoir, the Big Bend Reservoir, and the Oahe Reservoir to be developed in accordance with Senate Document No. 191, Seventy-eighth Congress, second session.

(3) The Oak Creek Reservoir, as proposed in House Document No. 475, Seventy-eighth Congress, second session, to be eliminated.

(*b*) Niobara, Platte, and Kansas Rivers: It was agreed to substitute the Bonny and Pioneer Reservoirs, as proposed in Senate Document No. 191, Seventy-eighth Congress, second session, for the Hale and Beecher Island Reservoirs as proposed in House Document No. 475, Seventy-eighth Congress, second session, and to the substitute the Enders Reservoir as proposed in House Document No. 475, Seventy-eighth Congress, second session, for the Harvey Reservoir as proposed in Senate Document No. 191, Seventy-eighth Congress, second session.

R. C. CRAWFORD,
Brigadier General,
United States Army,
Division Engineer.

GAIL A. HATHAWAY,
Head Engineer,
Representing Office of the
Chief of Engineers.

W. G. SLOAN,
Assistant Regional Director,
Bureau of Reclamation,
Billings, Mont.

JOHN R. RITER,
Acting Director, Branch of Project Planning.
Bureau of Reclamation,
Denver, Colo.

APPENDIX D

MISSOURI RIVER BASIN INDUSTRIAL WATER MARKETING

HEARING

BEFORE THE

SUBCOMMITTEE ON ENERGY RESEARCH AND WATER RESOURCES

OF THE

COMMITTEE ON INTERIOR AND INSULAR AFFAIRS UNITED STATES SENATE

NINETY-FOURTH CONGRESS

FIRST SESSION

ON

THE SALE OF WATER FROM THE UPPER MISSOURI RIVER BASIN BY THE FEDERAL GOVERNMENT FOR THE DEVELOPMENT OF ENERGY

July 18, 1975

PART 1

[LOGO]

Printed for the use of the
Committee on Interior and Insular Affairs

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MISSOURI RIVER BASIN INDUSTRIAL WATER MARKETING

FRIDAY, JULY 18, 1975

U.S. SENATE,
SUBCOMMITTEE ON ENERGY RESEARCH AND WATER RESOURCES, OF THE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C.

The subcommittee met, pursuant to notice, at 10 a.m. in room 3110, Dirksen Office Building, Hon. James Abourezk presiding.

Present: Senators Abourezk, Metcalf, and Burdick.

Also present: Russell Brown, professional staff member.

OPENING STATEMENT OF HON. JAMES ABOUREZK, A U.S. SENATOR FROM THE STATE OF SOUTH DAKOTA

Senator ABOUREZK. The hearing will come to order. I would like to welcome Senator Metcalf and Senator Burdick to the subcommittee.

This is the first in a series of open public hearings, whose purpose is to exercise congressional oversight over the sale of water from the Upper Missouri Basin by the Federal Government for energy development.

The push being given Project Independence, a plan proffered by this administration for rapid production of Western coal has put the predominantly argicultural economy of our region on the threshold of massive industrialization.

Despite the growing need by farmers, ranchers and communities in the Northern Plains region, the Federal administration has been moving forward to provide water

for electrical generating plants, coal liquifiction, and coal slurry lines to ship coal to other regions.

In February of this year, an agreement was made between the Departments of Army and Interior known as the "Memorandum of Understanding." This memorandum provides the basis for the two Departments to expedite the use of water for energy development from the main stem of the Upper Missouri River essentially for diversion to the coal fields of Wyoming.

Much protest has arisen from my State of South Dakota since this memorandum was signed. The basic question in my mind is whether this agreement by the two Departments could preempt State water rights particularly since an equitable apportionment has not been reached between the States who are facing their own decisions about water for agriculture and industry.

The water marketing activities by the Department of Interior in the Yellowstone Basin, a major tributary of the Upper Missouri, gives me no encouragement that this question has been answered. However, this question must be answered to the satisfaction of the people of the region most affected and the Nation before we move ahead in our zeal to develop Western energy reserves.

As you know, field hearings by the subcommittees have been scheduled for August 26, in Billings, Mont., and August 28, in Rapid City, S. Dak.

It is my intent to have the record of today's hearing published and distributed prior to those hearings in order to provide the opportunity for State and local government, as well as for individuals, to examine and comment on the Federal agency positions taken today.

Senator Church, who is chairman of this subcommittee, addressed a letter to the Secretary and the Secretary of the Army, in which he posed several questions regarding the memorandum of understanding.

I am placing in the record Senator Church's letter and the departmental response along with a copy of the memorandum.

[The material referred to above follows:]

UNITED STATES SENATE,
COMMITTEE ON INTERIOR AND INSULAR AFFAIRS,
Washington, D.C., June 6, 1975.

Hon. KENT FRIZZELL,
Acting Secretary of the Interior.

Hon. HOWARD B. CALLAWAY,
Secretary of the Army.

GENTLEMEN: This is to inform you that the Energy Research and Water Resources Subcommittee has scheduled a public hearing to examine the February 24, 1975, Memorandum of Understanding to "expedite the use of water for energy development utilizing the waters of the main stem reservoirs of the Corps of Engineers on the Missouri River" between the Secretary of the Interior and the Secretary of the Army.

The initial hearing for the purpose of tāking testimony from Federal witnesses will be held on June 26, 1975, at 10:00 a.m. in Room 3110 of the Dirksen Senate Office Building. Two additional hearings will be held—one in Billings, Montana, on August 26, 1975, and one in Rapid City, South Dakota, on August 28, 1975, in order to take testimony from State and local government and other interested parties.

In order to provide a more complete and useful hearing record, the Departmental witnesses, in their written statements, are requested to address the questions listed below:

1. Who controls, and by what authority, the available supply of water in the Upper Missouri River Basin, including but not limited to, that in the coal fields of the Yellowstone River Subbasin?

2. The Memorandum of Understanding calls for the execution of contracts for the marketing of water from the six main stem reservoirs on the Missouri River. With whom does an applicant for water in the main stem reservoirs file his request? In turn, which Department, Interior or Army, is responsible for signing and administering the contract with the water purchaser? Who has the power and authority to deliver the water when a contract has been signed?

What is the legal authority by which the Department and the Corps enter into contracts for Industrial sales on the Missouri?

3. How much Missouri River water is available for commitment pursuant to the Memorandum of Understanding? How and by whom was this calculation made?

4. Have applications for contracts been filed pursuant to the Memorandum of Understanding with the appropriate Department? If so, how many are pending or have been agreed upon? (Please supply for the record a list of pending applications or contracts including the identity of the reservoir, the quantity of the requested withdrawal, and the identity of the applicant or purchaser with the name and address of the parent company if the applicant is a subsidiary).

5. Are public hearings required prior to approval or disapproval of an applicant's request? If hearings are required, what are the requirement or practices regarding notice of hearings and their location? What opportunities are there for the Indian Tribes, BIA and other concerned agencies to be heard concerning water marketing on the Missouri?

6. What is the role of the respective State during consideration of a water marketing contract and is an opportunity provided for State review and comment on applications? Do the States have a veto authority over a proposed marketing agreement?

7. Is entering into a water marketing contract contingent upon the intended purchaser's possession of a State water right? In each of the States involved, who establishes and administers rights to main stem Missouri River water?

8. How many acre-feet of water are contracted or under option at each reservoir on the main stem? For what purposes—agriculture, industrial, or other—has the water been reserved?

9. Is either Department aware of situations whereby municipal or industrial options for water are precluding other area uses such as irrigation? If so, where?

10. Has either Department formulated a policy of reserving available water on the main stem for future uses, thereby discouraging present demands or other potential uses?

11. What is the nature and status of pending litigation to adjudicate Indian water rights in the Missouri Basin? Please provide for the record a list of pending litigation involving Federal agencies.

12. Have you established procedures for evaluating and choosing among conflicting uses of Missouri Basin water? If so, what are they?

13. What priority do you assign to development of additional generating capacity at existing dams on the main stem of the Missouri? Do you foresee any reduction in hydropower potential, or any further delays in its development, because of industrial water sales?

14. In order to evaluate the potential demand for agricultural water in the Missouri River Basin, list projects (including potential demands) for which:

a. Feasibility level studies are underway (with the projected study completion date);

b. Feasibility studies have been completed (identifying those projects found feasible);

c. Feasibility studies are proposed.

15. List also those projects which have been authorized and the respective stage of completion.

In accordance with the Committee rules, please provide 100 copies of your agency's testimony no later than June 24. They should be delivered to Russell Brown, professional staff member, in Room 3106 Dirksen Senate Office Building.

I would appreciate your informing the Committee who will testify at the June 26 hearing.

With best wishes.

Sincerely,

FRANK CHURCH,
Chairman, Subcommittee on Energy
Research and Water Resources.

ANSWERS TO QUESTIONS ASKED BY SENATOR FRANK CHURCH, CHAIRMAN OF THE SUBCOMMITTEE ON ENERGY RESEARCH AND WATER RESOURCES OF THE SENATE COMMITTEE ON INTERIOR AND INSULAR AFFAIRS IN HIS LETTER DATED JUNE 6, 1975, TO THE ACTING SECRETARY OF THE INTERIOR AND THE SECRETARY OF THE ARMY CONCERNING THE MEMORANDUM OF UNDERSTANDING BETWEEN THE RESPECTIVE SECRETARIES

1. *Question.* Who controls, and by what authority, the available supply of water in the Upper Missouri River Basin, including but not limited to, that in the coal fields of the Yellowstone River Subbasin?

Answer. Each of the States along the main stem of the Missouri River and the Federal Government have an interest in, and management responsibilities for, the available water supply from the river. The States have authority to grant permits for the use of the natural flow taken from the river. The right of the Federal Government to control the use of water in its reservoirs is based upon the legislation authorizing the construction and

operation of the reservoirs and upon Federal jurisdiction over navigable waterways.

Congressional authorization in 1944 of the Missouri River Basin Project, now identified as the Pick-Sloan Missouri Basin Program, placed certain Federal responsibilities over water uses on the Missouri River. That legislation clearly specified that the Corps of Engineers would be responsible for building the dams and for operating and regulating the reservoirs for flood control and navigation. The Bureau of Reclamation was designated to market the power generated at the mainstem reservoir hydroelectric generating stations. The Bureau also received authority to develop irrigation projects with the use of water from the mainstem reservoirs.

Power revenues are to be credited to a basin account which repays, with interest, the costs of the generating facilities; and surplus power revenues are to be used to repay the costs of irrigation which are beyond the water users' ability to repay. Therefore, regulation of the water for repayment of the reimbursable project costs, and regulation to serve the public interests for flood control, navigation, recreation, and other nonreimbursable functions are Federal responsibilities.

The hydrology of the main stem of the Missouri River is well enough known to conclude there is not enough natural flow in the Missouri River to meet existing and prospective uses during a portion of some years. Thus, reliance must be placed on the regulated flows for the six mainstem Federal reservoirs to supplement natural flow so that long-term commitments for water use can be made. Even when natural flow is available, consideration must be given to authorized Federal functions, including navigation, flood control, power, and other purposes.

A cooperative program between the States and the Federal Government for marketing industrial water will per-

mit an optimum use of the natural flow and regulated flow. A Federal-State cooperative water marketing program will mutually benefit the State and Federal interests involved and will enable each to exercise its respective rights and authorities without the need to quantify flows.

The procedures for marketing that are described in this and other answers to your questions apply only to waters which it will be determined, after full consideration of Indian water rights, are available for marketing independent of those rights. No procedures have yet been established for satisfying Indian water rights out of the main stem of the Missouri River.

2. *Question.* The Memorandum of Understanding calls for the execution of contracts for the marketing of water from the six mainstem reservoirs of the Missouri River. With whom does an applicant for water in the mainstem reservoirs file his request? In turn, which Department, Interior or Army, is responsible for signing and administering the contract with the water purchaser? Who has the power and authority to deliver the water when a contract has been signed? What is the legal authority by which the Department and Corps enters into contracts for industrial sales on the Missouri?

Question. With whom does an applicant for water in the mainstem reservoirs file his request?

Answer. The Upper Missouri Region of the Bureau of Reclamation in Billings, Montana, will administer the Federal aspects of the water marketing program. All applications filed with the Corps of Engineers in Omaha, Nebraska, or directly with the two Departments have been referred to the Bureau of Reclamation. However, the Department has extended the first option to the States to contract directly with the applicant. If that option is elected, the State itself would administer the contract.

In either case the water user will be expected to make application to the appropriate State for necessary water permits.

Question. In turn, which Department, Interior or Army, is responsible for signing and administering the contract with the water purchaser?

Answer. In accordance with the Memorandum of Understanding, the proposed contract terms and conditions must be satisfactory to the Secretary of the Army and the Secretary of the Interior. The Secretary of the Interior, through the Bureau of Reclamation, would execute and administer the contracts, if the appropriate State declined the option to contract.

Question. Who has the power and the authority to deliver the water when a contract has been signed?

Answer. Once State approval had been acquired, the water would be delivered pursuant to the terms of the contract and applicable State laws including those relating to State water use. The diversion and conveyance of water by the contractor would be at the contractor's expense and at locations approved by the Corps of Engineers and the Bureau of Reclamation. The contract would include water use schedules so that the Corps of Engineers could accomplish regulation and reservoir releases for the contractor's diversions, taking into account the contemporary and long-term hydrologic conditions of the river system.

Question. What is the legal authority by which the Department and Corps enters into contracts for industrial sales on the Missouri?

Answer. The legal authority for the Bureau of Reclamation's execution of water service contracts for municipal and industrial uses, under the Pick-Sloan Missouri Basin Program, is provided by section 9(c) of the Flood Control Act of December 22, 1944 (58 Stat. 887).

The water service contracts would be written pursuant to section 9(c) of the Reclamation Project Act of 1939 (53 Stat. 1187), as part of the reference to Reclamation Law contained in the 1944 Flood Control Act which authorized the Corps of Engineers to construct the mainstem storage reservoirs on the Missouri River. The Secretaries of the Army and Interior were provided full discretionary authority for management of the water resources to protect the operational and financial integrity of the Pick-Sloan Missouri Basin Program.

3. *Question.* How much Missouri River water is available for commitment pursuant to the Memorandum of Understanding? How and by whom was this calculation made?

Answer. The Memorandum of Understanding limits temporary industrial water availability to a quantity within the amount destined for eventual agricultural use. Projected water uses within the Missouri River Basin were authorized in the 1944 Flood Control Act. Quantification on the expected uses, the resulting depletions, and effects of the authorized plan were reported in April 1951 by a Subcommittee on Adequacy of Flows in the Missouri River Basin pursuant to a resolution of the Missouri Basin Inter-agency Committee (MBIAC).

Membership of the MBIAC in April 1951 consisted of the Governors of Nebraska, Missouri, Montana, South Dakota, and North Dakota and regional administrators from the Department of Agriculture, the Federal Power Commission, the Corps of Engineers, the Department of Commerce, and the Department of the Interior. The committee's resolution stipulated that—"such subcommittee shall consist of a representation from the U.S. Weather Bureau, the U.S. Geological Survey, the U.S. Public Health Service, the Federal Power Commission, the Bureau of Reclamation, the Department of Agriculture, and the Corps of Engineers; and that the State governments

be represented on the subcommittee by two State engineers, one from the Upper Basin and one from the Lower Basin."

Anticipated total future depletions were projected beyond 1949, and historic streamflow conditions were modified to 1949 levels of development. At that time, the streamflow and projected program depletions were:

UPPER BASIN ABOVE SIOUX CITY, IOWA,
ACRE-FEET ANNUALLY

Year	Average streamflow adjusted to 1949 level	Projected depletions authorized and anticipated
1949	24,593,000	0
1960		2,307,000
1970		4,539,000
1980		6,648,000
1990		8,461,000
2000		8,461,000

Of the projected depletions, most were associated with the 3,648,952 acres of new land irrigation and 490,468 acres of land requiring supplemental irrigation supplies under Bureau of Reclamation plans.

The projections have been modified and scheduling altered in the Missouri River Basin Framework Plan published in 1971. This study was similarly sponsored by the Missouri River Basin Inter-Agency Committee but included all 10 Missouri Basin States and 10 Federal agencies. The objective, however, is unchanged and demonstrates that considerable water intended for ultimate irrigation use could be used for energy-related purposes.

Using the Framework Plan, Corps of Engineers operation studies, and Bureau of Reclamation Rate and Repayment Studies, the Bureau of Reclamation determined in what quantities and during what time frame waters allotted to future irrigation use could be committed to interim nonirrigation users. Reclamation studies show that

up to 2 million acre-foot of mainstem reservoir storage will not be utilized for agricultural purposes before the year 2023. Of this available supply, we are proposing that 1 million acre-feet annually could be considered as available initially for the interim industrial water marketing program. This determination has been a joint endeavor by the Departments of the Interior and the Army, and it has been discussed with officials of the Upper Missouri River Basin States.

The industrial water availability study is based on the assumption that flow levels in the stream will be maintained at a minimum of 6,000 cubic feet per second to ensure water availability in the channel at all times. This can be accomplished best if the natural flow is not assumed to be available for claims by one State in preference to another. To meet the demands for possible industrial water throughout the hydrological cycle, the natural flow would require augmentation by stored water during critical periods at specific locations. In order to avoid prolonged controversy over respective water rights and to avoid fragmentation of water rights to respective State claims, it was concluded that natural flows and storage can be most effectively marketed on a cooperative Federal-State basis as one account. The 10 Governors of the Missouri River Basin States were advised of this intention by letter, dated March 25, 1975, from Assistant Secretary Jack O. Horton, and a first-option offer was given for the interested States to purchase a supply of water from the federally regulated reservoirs.

4. *Question.* Have applications for contracts been filed pursuant to the Memorandum of Understanding with the appropriate Department? If so, how many are pending or have been agreed upon? (Please supply for the record a list of pending applications or contracts including the identity of the reservoir, the quantity of the requested withdrawal, and the identity of the applicant or purchaser with the name and address of the parent company if the applicant is a subsidiary).

Answer. The Bureau of Reclamation has received some applications pursuant to the Memorandum of Understanding. To date, no contracts have been executed. There are 12 expressions of interest to the Corps of Engineers and 10 requests have been received by the Bureau of Reclamation regional office in Billings, Montana. Most of the inquiries on availability of water predate the February 24, 1975, Memorandum of Understanding and, therefore, each request will need to be reviewed. The requests received by the respective offices are shown in the attached tabulations. The expressions of interest pertain to 1,007,000 acre-feet annually when adjusted for the apparent duplication of the Energy Transportation System, Inc., request for 75,000 acre-feet from Oahe Reservoir. Further duplication of requests will be sorted out in the contracting and marketing processes established in accordance with the Memorandum of Understanding.

The water quantities requested by each contract will be reviewed carefully from a water use-efficiency standpoint as it relates to the proposed industrial undertaking. They would also undergo thorough environmental analysis and close Federal-State discussion. The proposed contracts will carry anti-speculation provisions. As stated earlier, 2 million acre-feet annually are considered available for the industrial purposes, although we believe this amount could and should permit other uses if the demand would be forthcoming.

5. *Question.* Are public hearings required prior to approval or disapproval of an applicant's request? If hearings are required, what are the requirements or practices regarding notice of hearings and their location? What opportunities are there for the Indian tribes, BIA, and other concerned agencies to be heard concerning water marketing on the Missouri?

Answer. Public hearings are not specifically required as a preliminary to the negotiation of water service contracts. The approval process of the Department of the

Interior, however, provides opportunity for participation by Indian interests and the Bureau of Indian Affairs. Public hearings are also an integral part of the NEPA process and would also be held as a matter of course if requested by the appropriate State.

Paragraphs 3b and 4 of the Memorandum of Understanding assign to the Department of the Interior responsibility for compliance with the National Environmental Policy Act of 1969 (NEPA). This will require environmental assessments and the preparation of environmental impact statements which would be filed with the Council on Environmental Quality for public review and comment.

Departmental regulations pursuant to NEPA provide for discretionary public hearings to solicit the views of interested parties. Notice of such hearings includes publication of the *Federal Register* at least 30 days before the hearing date.

In addition, and early on in the marketing program, the Department of the Interior will arrange to obtain the views of the Bureau of Indian Affairs and the Indian tribes in regarding to the water market opportunities. As a trustee of American Indian natural resources, the Department will give careful consideration to the *Winters* rights of the affected tribes during the implementation of this Memorandum of Understanding. (*Winters* v. *United States*, 207 U.S. 564 (1908)).

6. *Question.* What is the role of the respective State during consideration of a water marketing contract and is an opportunity provided for State review and comment on applications? Do the States have a veto authority over a proposed marketing agreement?

Answer. As discussed in our response to questions 1, 2, and 3, the marketing arrangements call for joint effort and mutual involvement with the States throughout contract negotiations. The States would have the first right to contract for water from the mainstem reservoirs. The

State could then subcontract with potential water users. If any State chooses not to contract for water, the desirability of the Federal Government contracting directly with potential water users will be reviewed with appropriate State officials, taking into account the State's decision not to participate in the marketing program. Given the State's inherent jurisdiction over State lands, State water uses, and rights-of-way, it would be both unlikely and undesirable for any application to proceed without State approval.

7. *Question.* Is entering into a water marketing contract contingent upon the intended purchaser's possession of a State water right? In each of the States involved, who establishes and administers rights to mainstem Missouri River water?

Answer. The right of the Federal Government to control water within its own reservoirs and on navigable rivers is based on the legislation which authorized construction and operation of the reservoirs or the control of navigable waterways. *Dugan* v. *Rank*, 372 U.S. 609, 623 (1963); *Turner* v. *Kings River Conservation Dist.*, 360 F. 2d 184, 198 (9th Cir. 1966); *United States* v. *Twin City Power Co.*, 350 U.S. 222, 224-225 (1955); *Tacoma* v. *Taxpayers of Tacoma*, 357 U.S. 320 (1958).

Our contracting principles will require that water users obtain from the Corps of Engineers the necessary permits or licenses to place diversion facilities on Federal property, and contractors will be expected to comply with all applicable State laws.

State water right laws in the Missouri River Basin indicate generally who may control waters. Waters which are captured within a reservoir, pursuant to a State water right, are normally controlled by the owner of the reservoir. The right of the Federal Government to control water within its own reservoirs may, therefore, be based on a State water right.

a. In Montana, a water right may be perfected by following the statutory procedures set out in MONT. REV. CODE 89-808-812 (1947); or by the construction of diversion or impoundment works, followed by the application of captured water to beneficial use. *Bailey* v. *Tintinger*, 45 Mont. 154, 122 P. 575 581 (1912). The statutory procedure has been followed on all Bureau of Reclamation projects except the Canyon Ferry Unit. On the Canyon Ferry Unit and on the Fort Peck Project of the Corps of Engineers, the alternate procedure recognized by *Bailey* was followed.

b. In North Dakota, the United States filed and had approved a water right application for 3,145,000 acre-feet of the waters of the Missouri, Souris, Sheyenne and James Rivers for use in connection with the Garrison Diversion Unit. The Bureau has also complied with the State water right laws in connection with the control and use of waters on other congressionally authorized reclamation projects in the State of North Dakota.

c. In South Dakota, section 61.0106 of the South Dakota Code, as amended in 1955, validates all vested rights which are defined in section 61.0102(7)(c) as "The right to take and use water for beneficial purposes where a riparian owner is engaged in the construction of works for the actual application of water to a beneficial use at the time of the passage of this chapter (March 2, 1955), provided such works shall be completed and water is actually applied for such use within a reasonable time thereafter." On March 2, 1955, the United States was a principal riparian owner on the Missouri River and the mainstem reservoirs of the Missour River Basin Project, with their appurtenant power generating facilities, were under construction, so that the Government's right to the use of the Missouri River waters now enjoys State validation.

8. *Question.* How many acre-feet of water are contracted or under option at each reservoir of the main stem? For what purposes—agriculture, industrial, and other—has the water been reserved?

Answer. Contracts for mainstem water have been signed on three units of the Pick-Sloan Missouri Basin Program. The Fort Clark Unit, with headquarters in Stanton, North Dakota, contains 1,929 irrigable acres. About 2,200 acre-feet of water are diverted annually. Construction is underway on the initial stages of the multipurpose Garrison Diversion and Oahe Units. Water use on these units will be for irrigation, municipal and industrial, fish and wildlife, and recreation. The water supply for the initial stage Garrison Diversion Unit in North Dakota will be pumped from Lake Sakakawea and will total about 871,000 acre-feet of water per year. The initial stage Oahe Unit in South Dakota will draw about 444,000 acre-feet from the Oahe Reservoir.

9. *Question.* Is either Department aware of situations whereby municipal or industrial options for water are precluding other area uses such as irrigation? If so, where?

Answer. No.

10. *Question.* Has either Department formulated a policy of reserving available water on the main stem for future uses, thereby discouraging present demands or other potential uses?

Answer. Only to the extent authorized by the Flood Control Act of 1944 establishing the Missouri River Basin Project, now the Pick-Sloan Missouri Basin Program. Reservations have been made for future irrigation units of the Pick-Sloan Missouri Basin Program. The industrial water availability study discussed earlier fully recognizes existing uses of water for legitimate diversions and those uses approved and authorized by the Congress.

11. *Question.* What is the nature and status of pending litigation to adjudicate Indian water rights in the Missouri Basin? Please provide for the record a list of pending litigation involving Federal agencies.

Answer. We are not aware of any pending litigation to adjudicate Indian water rights in the portion of the

Basin covered by the Memorandum of Understanding—the main stem of the Missouri River.

12. *Question.* Have you established procedures for evaluating and choosing among conflicting uses of Missouri Basin water? If so, what are they?

Answer. The O'Mahoney-Millikin Amendment to the Flood Control Act of 1944 (58 Stat. 887; 33 U.S.C. 701-1 (b)) provides that, west of the 98th meridian, the use of water for navigation shall be only such as does not conflict with any beneficial use for domestic, municipal, stock water, irrigation, mining, or industrial purposes. Current projections of water use indicate that there should not be any conflict among consumptive water users served from the mainstem reservoirs.

13. *Question.* What priority do you assign to development of additional generating capacity at existing dams on the main stem of the Missouri? Do you foresee any reduction in hydropower potential, or any further delays in its development because of industrial water sales?

Answer. We consider hydropower as having high priority. We believe that the interim water marketing quantity of 1 million acre-feet, which is about 5 percent of the historical flows at Sioux City, Iowa, is insignificant from the standpoint of evaluating additional generating capacity at existing dams on the main stem of the Missouri River. We see no reduction in hydropower peaking potential nor any delay for the development of needed hydropeaking capability because of the industrial water marketing program.

It is our understanding that all planned additions of generating capacity at the existing dams on the main stem of the Missouri would be peaking power. There would be little or no increased energy production from the addition of this generating capacity.

14. *Question.* In order to evaluate the potential demand for agricultural water in the Missouri River Basin, list projects (including potential demands) for which:

Qa. Feasibility level studies are underway (with the projected study completion date):

Qb. Feasibility studies have been completed (identifying those projects found feasible):

Ab.

[Table Omitted in Printing]

Qc. Feasibility studies are proposed or are being reappraised for the following units which involve diversions of water from the mainstream reservoirs.

Ac.

[Table Omitted in Printing]

15. *Question.* List also those projects which have been authorized and the respective stage of completion.

Answer. Authorized units under construction for irrigation purposes within the Upper Basin are those shown in 14Ab. Of those, Garrison Diversion Unit has been under construction since 1968, and first deliveries of water are expected in 1978, with completion of service facilities in 1987. Oahe Unit construction has barely started, and first water deliveries are scheduled for 1982. Completion is expected in 1994.

Enclosure.

INDUSTRIAL WATER REQUESTS RECEIVED BY BUREAU OF RECLAMATION JUNE 18, 1975 *

Company	Acre-feet requested	Purpose
Consolidation Coal Co.	50,000	Industrial.
Sun Oil Co.[1]	50,000	Gasification.
John S. Wald	50,000	Industrial.
Mobil Oil Corp.	50,000	Unspecified.
Getty Oil Co.	50,000	Mineral development.
Mobil Oil Corp.	50,000	Unspecified.
Wesco Resources	60,000	Power generation coal gasification.
Phillips Petroleum Co.	50,000	Industrial.
Energy Transportation Systems, Inc.	75,000	Coal slurry.
American Natural Gas Service Co.[2]	68,000	Gasification.
Total (Fort Peck, 360,000, Sakakawea, 118,000; Oahe, 75,000).	553,000	

* Company address, date of request and lake omitted in printing.

[1] Request from HFC Co., Inc., which was acquired by Sun Oil Co.

[2] Application under name of Michigan Wisconsin Pipe Line Co., recent correspondence also includes the name "ANG Coal Gasification Co."

INDUSTRIAL WATER REQUESTS RECEIVED BY CORPS OF ENGINEERS, JUNE 15, 1975 *

Company	Acre-feet resquested	Purpose
Energy Transportation Systems, Inc...	75,000	Coal slurry.
NRG Co.	50,000	Coal development.
Tenneco Coal	50,000	Unspecified.
Basin-Electric Power Cooperative.	9,000	Powerplant cooling.
Potashnick Construction, Inc.	50,000	Coal development.
Kansas-Nebraska Natural Gas Co., Inc.	25,000	Coal gasification.
I. H. Garms & Sons Co.	50,000	Coal development.
Chevron Oil Co.	50,000	Do.
Dreyer Bros. Co.[3]	97,000	Do.[4]
Gulf Mineral Resources Co.	50,000	Unspecified.
Shell Oil Co.	[5]	Coal development.
Chevron Oil Co.	23,000	Power generation, coal gasification.
Total (Fort Peck, 372,000; Sakakawea, 32,000; Oahe, 125,000).	529,000	

* Company address, date of request and lake omitted in printing.

[1] Sept. 1, 1974 rights transferred to intake Water Co.

[2] Subsidy of Burlington Northern.

[3] Attorneys for Dreyer Bros. Co.

[4] June 27, 1974 water right application was for only 67,000 acre-feet, 35,000 for irrigation, 9,000 for production of ammonia, 8,000 for methanol-methyl fuel, and 15,000 for synthetic diesel fuel.

[5] Unspecified.

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